

YOUR COMMODORE

AN AMIGA SPECIALIST PUBLICATION

November 1987 £1.25

AMIGA
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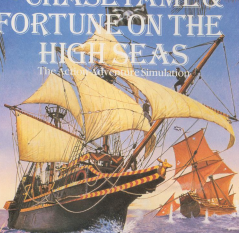


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CARTRIDGES

● LOGOTRON 1295—WORDPROCESSOR, DATABASE AND SPREAD—
SHEET REVIEWED ● DISK MENUS FOR PLUS/4
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Pirates! is the most realistic pirate game ever. Pirates! is the most fun pirate game ever.

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Exp. date:

Signed:

Name:

Address:

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TEL: 061-480 0071

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Blandford, Dorset DT11 1NS



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ARGUS
PRESS
GROUP



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DATA STATEMENTS

Prepare for the Cold with U.S. Gold

Here I say it, but Christmas is not far away and U.S. Gold have come up with an impressive preview list once again.

Charlie Chaplin enables you to become a silent movie director and produce the world's greatest slapstick comedian in an epic production. Choose your script, get your props together and you're ready for ACTION. A score compiles of an audience, and if you like it, you can go onto the next scene. The real test however is the audience reaction to the final version, which in the long run will govern your earnings - well better be good! Available on the C64.

Following the success of *Infiltrator*, *Infestor II - The Next Day* is now in the pipeline. *Infesto-Baby* embarks on three entirely new missions to save the world from the clutches of Mad Leader. The missions include neutralising a deadly nerve gas compound, destruction of the enemy's supply of deodorant neutron bombs and a final desperate confrontation with the Mad Leader himself.

Infestor II and *Charlie II* coming soon

Infestor II will be available on C64 priced at £6.99 (ret) and £9.99 (rshk) or including *Infestor I* for £9.99 (ret) and £14.99 (rshk).

For all you *Gamelet* fans, prepare yourself for *Gamelet II*. Choose your original *Gamelet* character and come up against new creatures such as the fire-breathing dragon and the IT creature.

Fight your way through the wretched mazes, keeping an eye out for star tiles and acid puddles! Do not despair, *Gamelet II* does have some new features to help you with your escape!

Gamelet II will be available for the C64.

Other releases being prepared for the Christmas period are *Kyber*.



Indiana Jones, *720°* and *Clonus*. It looks as if a good Christmas will be had by all!

Forthline:
U.S. Gold Ltd Unit 2/3 Halford Way,
Halford, Birmingham B674X. Tel 021-256 4088.

Budget Bonanza

Following the success of the Silver budget range, Firebird are releasing a new budget label. Priced at £2.99, this range will be aimed at the user who is looking for a slightly more up-market product but which is still good value.

The blockpods are back in *Water Walk* on the C64. Help the blockpods across fragile areas of blocks - but beware, as the blocks can break or burn the blockpods feet, and whatever you do - don't let them fall through the gaps!

Pink Music is a polyphonic sequencer which drives all the best features from the C64 SID processor. Access all waveform modulation features on the three (built-in) channels and the fourth channel will allow you to include digitised sounds.

Forthline:
Firebird Software, First Floor, 64-67
New Oxford Street, London WC1A 1PS. Tel 01-579 6723.

Back-It is the new budget range from Housen with games ranging from mind-busing puzzles to arm-waving shoot-em-ups. The games will sell for £2.99 with an overall theme of black and white, with great graphics.

Dragon's Den will appeal to those seeking an intellectual challenge, and adventures such as *Mr Horle* and *Firebirds* for the middle of the road players. Last but not least, *Powerzone* and *Amorby* will appeal to all those who enjoy a good shoot-em-up!

The games will be available on the C64 and will be priced at £2.99 each.
Forthline:
Merrow Ltd, Merrow, Farnham County, Alden, Abingdon, Oxon OX14 4RT. Tel 01235 237979.





Commodore latest signing

Shooting for the Top

Commodore UK Ltd's advertising strategy is underman with the co-operation of a few lads – the Chelsea Football team to be precise! Yes – for the next three years the team will sport(!) the revamped shirts bearing the Commodore logo, which will also be displayed around the home ground perimeter boards.

The biggest deal in British football to date was finalised with the presentation of a cheque for £1,250,000 to the Chelsea Football club.

Commodore and Chelsea respectively are aiming for the top and both feel they can climb the ladder to

success together. There's more than the 'C's and their colours which bind them together. As well as the advertising, Commodore dealers will be able to take advantage to the limit through various promotional options.

Commodore have a history of sporting links following their German sponsorship of Bayern Munich and Dynamo Kiev and the backing of the first professional cycling tour of Britain.

Touchline:
Commodore Business Machines (UK) Ltd: Commodore House, The Swisschuck, Gardner Road, Maidenhead, Berks SL6 7LA. Tel: 0629 778084.

Join the Club

The only requirement for free membership to the Chelsea Club is to own one of Commodore's products. All members can then keep up-to-date with regular news bulletins, special offers and product discounts. If you own a product simply write to the following address for an application form.

Touchline:
Chelsea Marketing Ltd: Norbury House, Norbury Road, Falmouth, Cornwall CT5 4AN. Tel: 0212 515171.

Beat the Brain

Ever dreamed of reconstructing your IQ – well, now is your chance in *PU2* – a recent release from Mind Games. The problems arise when you play the part of Professor Storm – the Geometric Genius, and suddenly you discover you haven't a single mathematical formula in your brain! Work your way around the logic and which then connect the memory bubbles containing the formula you need. Can you prevent the good professor from becoming a moron – there's only one way to find out! Available on the C64, priced at £9.95 (ret) and £12.45 (disk).

Touchline:
Mind Games (ASP Software Group), Victory House, Ercongate Place, London WC2N 7NB. Tel: 01-429 4666.

Software for HMV

A games software department is to be opened in HMV Music Stores aiming to hold the largest range of software in Oxford Street, London.

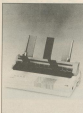
Andrew Tait, HMV's software expert comments, "we will be mass merchandising all new releases with discounts on selected new titles. As well as this our customers can look forward to great in-store promotions and competitions".

So, when you're browsing for your latest LP's at 30 Oxford Street, remember you can get your computer software there as well.

Touchline:
Lynne Francis Ltd: 4-10 Frederick Chase, Stamhope Place, London W2 2HD. Tel: 01-724 6777.

HMV take Software

DATA STATEMENTS



Brother 1724

The latest on the Hardware Front

Brother has recently acquired the rights to the Terminator joystick from the Denmark based company Supersoft. Brother will be covering the UK and Germany, and sales director, Mike Sgroes commented, 'we are looking to achieve very high sales on what is an excellent and very novel product. The Terminator costs £18.95.

In a bid to produce quality disks at low prices, Mydisk Ltd has produced a range, with prices starting at £7.99 for a box of thirteen. Managing Director Simon Kelly promises, 'if a customer can find branded disks of the same quality at a cheaper price, then Mydisk will refund the difference'. Each disk has a clipping level of 85% and comes with a 'one-for-one' guarantee, i.e., a faulty disk will immediately be replaced with two.

Brother has recently produced the 1724 - a letter quality dot matrix printer which will sell for £895. The 24 pin 1724 operates at 210 characters per second in draft and often fast letter quality printing at 72 cps. The 1724 is compatible with Epson 8000, Diablo 630 and IBM Proprinter XL, and a dual interface, Commodore and RS232, is available. John Carter, Sales and Marketing Manager for Brother comments, 'the introduction of the 1724 exceeds our selection and supplements the 2624L in our 24 pin range'.

Terminator

Address: Unit One A, Silverwell Business Complex, St Johns Road, Plymouth, Devon, PL7 6AL. Tel: 01-997 4957.

Mydisk Ltd, Parley Hall, London Road, Bedford Road, Bedfordshire MK12 1ED. Tel: 0144 801688.

Brother Computer Peripherals Division: James & Brother, Shipley Avenue, Glade Bridge, Andyarham, Manchester M14 5JD. Tel: 061-630 4507.

Strategy and Adventure

PSX have recently launched a new series of strategy games - with *Classic Conflicts*. Three of the titles are re-releases of the Classic PSX titles - *Throne Europe*, *Battle for Midway* and *Battle of Britain*. Another title in the pipeline is *Power Struggle* which is a game of world domination.

Classic Conflicts is available on C64, and will be priced at £4.99 (cas and disk).



Battle of Britain

CRU's follow-up to *Cyborg* is in the form of *Manifold*. You are Cyborg and your mission is to retrieve the stolen blue prints and so they can be used for the good of mankind. This is a world of bandits, prostitutes, darkwands - a world of debauchery. However the longer you take to retrieve the blue prints the more *Manifolds* are put into production and you must discover how these complex machines are de-activated and ultimately find your way through the complex labyrinth to the safe which holds the vital information.

Manifold is available on the C64, and will retail at £9.95 (cas) and £14.95 (disk).



Manoff

Manoff are putting the finishing touches on their racing game - *Angel Manoff's Grand Prix*, and so all you budding drivers - be prepared. As the driver, you have access to the latest in car design and technology. Whether you simply want to blast around the track at excessive speeds with the turbo on maximum boost without a care in the world as to whether you want to race a selection of the world's greatest circuits, this game is for those who enjoy the excitement of speed.

Angel Manoff's Grand Prix will be available on the C64.

Airborne Anger is a recent release from MicroProse and is an action simulation with 12 desperate missions in three different regions of the world. Tactical thinking and lightning reactions will win the day. *Airborne Anger* will be available on C64/128, priced at \$14.95 (cas) and £19.95 (disk).

A second MicroProse release comes in the form of *Seraph Fighter* - simulation of a nuclear strike jet fighter believed to be testing as part of the US Air Force arsenal.

Seraph Fighter will be available on C64/128, priced at £14.95 (cas) and £19.95 (disk).

TouchWarc

PSX: 412, Emory Stanton Road, Croydon CR9 5DA. Tel: 0181 681554.

CRU: CRU House, 9 Kings Road, Carpenter's Road, London E15 2AB. Tel: 01-553 2948.

Manoff: Manoff House, 80a Terrace, Foreway, Rye, East Sussex, BN24 6EE. Tel: 0232 769426.

Microprose: 2 Markie Place, Gt. Yarm, Gt. Yarmouth GL8 8DA. Tel: 0665 54126.

Business Bargains

Is Logotron's trio of business programmes a portfolio for success?

By Eric Doyle

Logotron has steadily built up a solid reputation through producing software for the BBC micro. Even C64 owners may have heard about *SOB*, the game that took the BBC franchise by storm. Soon all C64 owners will have heard of Logotron when they enter the C64 market with their new 1285 business software range.

There are three packages in the set: a wordprocessor, a simple database and a spreadsheet. Nothing technically revolutionary except where cost is concerned.

Wordprocessing

Logotron Writer 1285 is a sophisticated word processor with built-in spelling checker and mail merge facilities. It is simple to use, but there are one or two tasks which must be performed when you first use it.

The newly loaded program presents the user with a horizontal menu offering six categories: edit, options, print, storage, setup and quit. Selecting any of the categories will open up a sub-menu window showing the full range of options.

It is best to select the setup (setup first because, as the sub-menu reveals, you have the opportunity to insert up to seven codes which allow you to

access some of the special features your printer may possess. You can also select ASCII or non-ASCII (normal Commodore) output, the inclusion of extra linefeeds or a specific device number and secondary address.

Under the sub-heading of setup storage, dual disk drive operation can be selected and a further heading allows the screen display colours to be changed. When all is as you would wish it to be, the fourth option allows you to save the parameters to disk to be automatically loaded each time you use the Writer.

Option opens up the possibilities of search and replace, preview and spelling check.

Search merely finds every occurrence of a specified word in the text. Search and replace not only finds the word but also replaces it with a new word of any length which you have selected.

Because the screen is only 40 characters wide and most printers work to an 80 column width, the preview option is essential. The formatted pages of your document appear just as they will on the printout. This gives you time to make those small changes which always seem necessary before you commit your work to paper.

It's a good idea to check your documents for spelling mistakes before printing. This is a good option to have and surprising on such a low cost product. Unfortunately this option has a weak point: the given dictionary is fixed, you can't add or subtract words to cater for your specific needs.

Since the spelling checker only checks the words which it knows, 'catalogue' spelled in the American way (without the 'u') will remain unaltered because the word is not included in the dictionary's 1000 word database. All this apart, the spelling checker does work, given this small limitation.

Storage allows disk access for loading and saving files, sending disk commands to erase old documents or to format a whole disk. The loading process is further simplified by the inclusion of a directory facility which lists all of the document files onto the screen. From the list you can load the file that you want by highlighting the required document name.

The save menu option is print which is not only for saving the printer but is also for sending the current file to disk as an ASCII file. Here the special mail merge facility can be called, but more of that later.

Edit releases you from the menu as

that you can create a document and get merry (most the computer to basic).

Such are the facilities offered by this program that I'm not just mentioning the cut 'n' paste or the special feature menu. Basically the cut 'n' paste menu allows the user to move text around, either replacing, replicating or creating selected blocks. Regularly used sections such as copyright, clauses or letter heads can even be merged in from disk.

Special features allow all of the special printer functions which have been defined previously. These can include underlining, boldface type, compressed text or expanded text. In addition right justification, borders and boxes, page format, tab settings or centering can all be set. It is also possible to append files forming a chain of files should you be working on a number of similarly long documents.

The merge function works in conjunction with the Filer 1285 program. Fields may be selected from a file for insertion in documents. For example, if you are working upon an advertising material to several companies, a standard letter is created and merge marks included where each company's address will appear. At print time the file database disk is placed in the drive. Each time the letter is printed a new address is pulled in from the disk and printed wherever indicated.

The text memory boasts about 69K of space. In real terms this means 19,000 characters, or approximately 3,900 words, or just under 500 lines making this a valuable wordprocessor for any user.

The Database

Filer 1285 is a simple database which is both friendly and cheap. The hard part is inputting all of the data which you want to store.

Each Filer database occupies a single disk so the maximum number of records is limited by the simple equation of free disk memory divided by the number of bytes which each record is allocated. The fewer the number of fields in a record, the greater the number of records per database.

In case I'm losing you at this point, let me explain in layman's terms. A database is a catalogue of grouped information. Usually the groups are individual and company names which, like entries in an address book contain various other details such as addresses, phone numbers etc.

In such a database a record would consist of all of the information referring to one particular company or individual. Fields are the individual entries which make up a record such as name, address, phone number etc.

One of the fields can be designated as the key field. This is the name under which the record will be entered and usually consists of the name of the company or the surname of an individual.

What is kept in a database is entirely up to the user when the record fields are defined. Filer 1285 has several field types to help in maximising the memory efficiency of the system. With only 250 bytes allowed per page, memory is at a premium, thus the full allowance of 25 characters per field, a disk will hold 250 records. Fields can fall into one of four types: keyfield, alphanumeric, numeric or date.

Once you've carefully entered all the records in your database, changes and deletions can be made or, first space permitting, further deletions can be made.

When you end up with a very useful file which can be used in various ways. Files can be selected and saved according to criteria selected by your own words. For example, if you want to separate out all of the people who live in the Leeds area, own a C84 and a cat, you simply set these criteria and let the computer do the rest. If you then want to print out selected information from the database, such as name and address for labels, this can be achieved by generating a report sheet.

Within the limitations of ten fields, each holding 25 characters, quite a lot can be done but a lot of thought has to be applied first.

To maximise memory use you can use a coding system like binary for one of the fields. If someone complains with a particular criterion then a one is recorded, if not a zero is used. The result would be a number such as 1101 which could mean that the person in question is married, male, childless but car owning. To find other married car owners you could then specify a match to equal 1111. The question marks mean that any character will be accepted for sex and parenthood, but only a positive indicator for marital status and car ownership will be accepted.

If you just want a list of married people you can ask the computer to find a match for 1*. This means that the first figure has to be a one, but the other figures can be anything.

Using a master chart these codes can be converted into real terms and

Easy Working Planner		F2 HELP	
work print change		storage	F4
		new work sheet	
		load work sheet	
		save work sheet	
		load disk file	
		save disk file	
		directory	
		import data	
		export data	
		erase files	
		format disk	
Income H1 Jan			
Income H2			
Misc. Income			
=====			
Total Income \$2			
Rent	6500.00	6500.00	
Electric	200.00	200.00	
Phone	200.00	200.00	
Gasoline	200.00	200.00	
Clothing	200.00	200.00	
car loan	200.00	200.00	
Food	200.00	200.00	
Entertainment	200.00	200.00	

you're not limited to entry once and done. If someone has two cars why not record the fuel with a figure two?

Filer 1295 may be a humble database but for many people it is powerful enough if used sensibly.

mathematical operators plus a few specially defined functions for dealing with groups of cells. Using these commands the sum, difference or average of a group of cells can be calculated, and the maximum and

Conclusion

Legislation has three excellent products which were tailored for the British market from an American program created by Spinnaker Software. Planner 1295 is particularly comprehensive and writer 1285 is more than adequate for most people's needs. Even the weakest module, Filer, is powerful enough to be considered for small business use. It is true that a range of programmes prove quite as satisfactory as this trio - perhaps they could become the Lotus 1-2-3 of the C64 world.

Touchline

Software: Wordprocessors, Spreadsheets, Database, Prices £12.95 each.
Supplier: Touchline Ltd, Dales Road, Gt. Mill, Alton, Cambridge CB1 2LL
Tel: 0223 329456



The Spreadsheet

Planner 1295 is probably the most powerful spreadsheet available at this price range.

Starting with a fairly basic sheet of income and outgoings, the Planner will grow in complexity as your finances become more involved. Insertion and deletion of columns and rows is easily achieved, as is cutting and pasting whole sections for transplanting to another part of the sheet or across to another sheet completely.

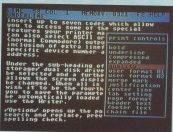
The advantage of these facilities is that detailed planning of the layout of your sheet is not essential. As long as you are somewhere near to your requirements, corrections can be made later.

The size of the sheet depends on the complexity of its contents. Columns can be set to any width from three characters up to a maximum of 57. Using a column width of 12, I still had about 7% of memory left when I created a 36x44 matrix!

Definition of cell contents is simplicity itself. If you want it to text just type in the letters; if it is to be a fixed value, type it in; for a formula type an equals sign first. Calculations can be extremely complex using all

minimum values can be found. The range is staggering.

Feeling out the linked sheet has the usual limitations of paper width. If the spreadsheet is more than 28 characters wide, it is possible to select different areas of the sheet, print them out and then use sticky tape to recreate the full spread.



Kernal II

Add easy file handling and much more with this pull down menu system.

By Patrick Chable

The Commodore 64 may be a great computer but no one will deny that its file handling could be greatly improved. After all, if you need to get in directory on a normal C64 you have to erase the program that is currently in memory.

Kernal II will patch itself into the C64 operating system and provide you with a series of menus that will greatly improve the ease of which you can LOAD, SAVE and find details on programs.

When the program is in use, an arrow is resident on the computers display. This arrow can be moved around the screen with a joystick in port 2. Across the top of the screen a strip is displayed giving the titles of the pull down menus available. These are, DISK, TAPE AND OPTIONS. To activate the menu you must position the pointer over the option and press the fire button. All of the commands available under that heading will appear. To select one, move the pointer to the command that you require and press fire.

All commands, having carried out their work, display an OK prompt. Just place the pointer on this, press

fire, and the machine will return to the program that was running before the command was executed.

As well as offering pull down menus the operation of a fire key is altered by the program. Pressing F1 stops the computer and F3 restarts it. This allows you to stop a Basic listing or a directory listing. The RUN/STOP and RESTORE keys will not perform a warm reset as normal.

Below you will find a list of all of the functions available from the program.

Disk Menu

SAVE - this routine allows you to SAVE a program or a block of memory. The computer asks you for the file name. Type this in on the keyboard in the normal way, delete mistakes with the DEL key. KERNAL II will not allow you to enter a name with more than 16 characters. If you try to enter more the program will automatically jump to the next SAVE option. If you don't need a program name as long as 16 characters you can press RETURN once you have entered the desired number of letters.

Once you have entered the program name a second pull down menu will be displayed. First you are asked whether the program is BASIC or ELSE. Move the arrow and press fire to select the desired option. BASIC means that the program is to be SAVED in Basic and will be SAVED in the normal way.

If ELSE is selected then you are allowed to SAVE machine code. You are prompted for the start and end address of the code to be SAVED, in hex. These numbers must be four digits in length, i.e. 80 becomes 0080. This program could be SAVED with this option. The start address is 8000 and the end address is 9500.

LOAD - this works in the same way as SAVE. If ELSE is selected for the program type then you are just prompted for the address where you want the LOAD to start. S.B. Basic programmers are LOADED into the computer as though you had entered LOAD "name".S.B.

VERIFY - this will verify the specified program on disk.

ERROR - this command reads and displays the error status of the disk drive.



COMMAND - the normal disk commands, e.g. LNS etc, can be entered here.

DIRECTORY - this routine will display all files that are on the disk, even deleted files are displayed. You can pause the listing with F1 as detailed earlier. RUN/STOP will stop the listing and run with an OK. N.R. it may be necessary to rewind a disk with the 10 command before displaying a directory.

TAPE MENU

SAVE, LOAD and VERIFY options are identical to those for disk, but operate with the tape deck.

OPTIONS MENU

CONTROL PANEL - this routine will allow you to change the colours of the

border, screen and text. When you leave this with an OK the colours are set in memory. Using the RUN/STOP and RESTORE keys, or the restore, option will return the screen to those colours.

EXIT - this command returns the computer to its normal state, without **KERNAL II**. You can start the program again with: **POKE 32752,0**

Followed by:

SYS 64736

Kernal II uses this 15.1 and channels 15.1 so take care not to use these in your own programmes. The program is stored in memory from 58000 to 59700. It also uses memory in the 8C000 to 8C400 region. Since this program patches into the operating system it is extremely unlikely that it will work with commercial software.

Getting it all in

The program is presented here as a Basic Loader that **POKEs** all of the machine code into memory. Use the **SYNTAX CHECKER** program when entering the program to help with your typing, see **LISTINGS** page.

Once the program is in memory you can **SAVE** a working version of the program using the **SAVE, ELSE** commands within the program and specifying a start and end address as detailed within the article.

The machine code version of the program **SAVED** in this way will obviously **LOAD** much faster than the Basic version. To use this program you should type:

LOAD "name",A,1 for disk or
LOAD "name",I,1 for tape.

Once the program has **LOADED** enter **SYS 64736** to start it.

See Listings on page 115-117

COMMODORE PLUS-4/C16 NEW-BANDS and CRASHES RHYTHM BOX

The **NEW-BANDS** and **CRASHES** are two new routines that can be used to create a new rhythm box. The **NEW-BANDS** routine will create a new rhythm box from a given set of notes. The **CRASHES** routine will create a new rhythm box from a given set of notes. Both routines are easy to use and can be used to create a new rhythm box from a given set of notes. The **NEW-BANDS** routine will create a new rhythm box from a given set of notes. The **CRASHES** routine will create a new rhythm box from a given set of notes. Both routines are easy to use and can be used to create a new rhythm box from a given set of notes.

NEW-WISP Amazing new product!

NEW-WISP is a new routine that can be used to create a new rhythm box. The **NEW-WISP** routine will create a new rhythm box from a given set of notes. The **NEW-WISP** routine will create a new rhythm box from a given set of notes. Both routines are easy to use and can be used to create a new rhythm box from a given set of notes. The **NEW-WISP** routine will create a new rhythm box from a given set of notes. The **NEW-WISP** routine will create a new rhythm box from a given set of notes. Both routines are easy to use and can be used to create a new rhythm box from a given set of notes.

NEW-BLACK CAT 2

NEW-BLACK CAT 2 is a new routine that can be used to create a new rhythm box. The **NEW-BLACK CAT 2** routine will create a new rhythm box from a given set of notes. The **NEW-BLACK CAT 2** routine will create a new rhythm box from a given set of notes. Both routines are easy to use and can be used to create a new rhythm box from a given set of notes.

THE MIRROR-TAPE BACK UP

This is a new routine that can be used to create a new rhythm box. The **THE MIRROR-TAPE BACK UP** routine will create a new rhythm box from a given set of notes. The **THE MIRROR-TAPE BACK UP** routine will create a new rhythm box from a given set of notes. Both routines are easy to use and can be used to create a new rhythm box from a given set of notes.

THE WAND-TAPE TO DISC

This is a new routine that can be used to create a new rhythm box. The **THE WAND-TAPE TO DISC** routine will create a new rhythm box from a given set of notes. The **THE WAND-TAPE TO DISC** routine will create a new rhythm box from a given set of notes. Both routines are easy to use and can be used to create a new rhythm box from a given set of notes.

PHOTON LOAD- FAST LOAD AND SAVE

This is a new routine that can be used to create a new rhythm box. The **PHOTON LOAD-FAST LOAD AND SAVE** routine will create a new rhythm box from a given set of notes. The **PHOTON LOAD-FAST LOAD AND SAVE** routine will create a new rhythm box from a given set of notes. Both routines are easy to use and can be used to create a new rhythm box from a given set of notes.

SUPER SPRINT

This is a new routine that can be used to create a new rhythm box. The **SUPER SPRINT** routine will create a new rhythm box from a given set of notes. The **SUPER SPRINT** routine will create a new rhythm box from a given set of notes. Both routines are easy to use and can be used to create a new rhythm box from a given set of notes.

ELECTRIC PENCIL

This is a new routine that can be used to create a new rhythm box. The **ELECTRIC PENCIL** routine will create a new rhythm box from a given set of notes. The **ELECTRIC PENCIL** routine will create a new rhythm box from a given set of notes. Both routines are easy to use and can be used to create a new rhythm box from a given set of notes.

CASSETTE INTERFACES

This is a new routine that can be used to create a new rhythm box. The **CASSETTE INTERFACES** routine will create a new rhythm box from a given set of notes. The **CASSETTE INTERFACES** routine will create a new rhythm box from a given set of notes. Both routines are easy to use and can be used to create a new rhythm box from a given set of notes.

MERLIN ASSEMBLER

This is a new routine that can be used to create a new rhythm box. The **MERLIN ASSEMBLER** routine will create a new rhythm box from a given set of notes. The **MERLIN ASSEMBLER** routine will create a new rhythm box from a given set of notes. Both routines are easy to use and can be used to create a new rhythm box from a given set of notes.

JOYSTICK ADAPTOR

This is a new routine that can be used to create a new rhythm box. The **JOYSTICK ADAPTOR** routine will create a new rhythm box from a given set of notes. The **JOYSTICK ADAPTOR** routine will create a new rhythm box from a given set of notes. Both routines are easy to use and can be used to create a new rhythm box from a given set of notes.

Tape Head Alignment C16-4

This is a new routine that can be used to create a new rhythm box. The **Tape Head Alignment C16-4** routine will create a new rhythm box from a given set of notes. The **Tape Head Alignment C16-4** routine will create a new rhythm box from a given set of notes. Both routines are easy to use and can be used to create a new rhythm box from a given set of notes.

COMMODORE 64 EVER HAD A LOADING PROBLEM?

This is a new routine that can be used to create a new rhythm box. The **COMMODORE 64 EVER HAD A LOADING PROBLEM?** routine will create a new rhythm box from a given set of notes. The **COMMODORE 64 EVER HAD A LOADING PROBLEM?** routine will create a new rhythm box from a given set of notes. Both routines are easy to use and can be used to create a new rhythm box from a given set of notes.

RAPID despatch of orders.

This is a new routine that can be used to create a new rhythm box. The **RAPID despatch of orders.** routine will create a new rhythm box from a given set of notes. The **RAPID despatch of orders.** routine will create a new rhythm box from a given set of notes. Both routines are easy to use and can be used to create a new rhythm box from a given set of notes.

WIZARD SOFTWARE (Dept. 7121) 20 Washburn Drive, Asheville, North Carolina 28801
Phone 704 634 1234

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Function Key Template

It is not easy remembering all the functions of the C64 Keyboard. A program using the C64 and 1520 printer/plotter can solve the problem by producing a template.

By John Allison

The Commodore 64 keyboard has only four function keys, but each one can be used in four ways. The function keys can be pressed on their own or in conjunction with the SHIFT, CTRL (the key with the Commodore symbol) or other CTRL keys. This gives us 16 unique key definitions. In the Extended Basic program given away on tape with the November 1986 issue of *Your Commodore*, all sixteen function keys can be programmed.

This can make program development much simpler and easier, especially as the keys can be easily re-defined by the programmer. However, there is a small problem. When you have defined the keys and are merely typing away and want to use one of the function keys to save time and trouble, you cannot remember which key gives the proper result? Was it 15 or 16? And is it CTRL or function key 3 or is it CTRL and function key 3? If you have a Commodore 1520 printer/plotter, as well as a C64 computer, this program will solve these dilemmas. It will produce a template which can be fixed over the keyboard around the function keys. The template will remind the user of each function key definition and which key combination to press to obtain it.

Commodore 64 Function Key List

The C64's sixteen functions can be obtained, providing that they have

EXBAS YR COMM			
0000+	0001+	0002+	0003+
0004+	0005+	0006+	0007+
0008+	0009+	0010+	0011+
0012+	0013+	0014+	0015+
0016+	0017+	0018+	0019+
0020+	0021+	0022+	0023+
0024+	0025+	0026+	0027+
0028+	0029+	0030+	0031+
0032+	0033+	0034+	0035+
0036+	0037+	0038+	0039+
0040+	0041+	0042+	0043+
0044+	0045+	0046+	0047+
0048+	0049+	0050+	0051+
0052+	0053+	0054+	0055+
0056+	0057+	0058+	0059+
0060+	0061+	0062+	0063+
0064+	0065+	0066+	0067+
0068+	0069+	0070+	0071+
0072+	0073+	0074+	0075+
0076+	0077+	0078+	0079+
0080+	0081+	0082+	0083+
0084+	0085+	0086+	0087+
0088+	0089+	0090+	0091+
0092+	0093+	0094+	0095+
0096+	0097+	0098+	0099+
0100+	0101+	0102+	0103+
0104+	0105+	0106+	0107+
0108+	0109+	0110+	0111+
0112+	0113+	0114+	0115+
0116+	0117+	0118+	0119+
0120+	0121+	0122+	0123+
0124+	0125+	0126+	0127+
0128+	0129+	0130+	0131+
0132+	0133+	0134+	0135+
0136+	0137+	0138+	0139+
0140+	0141+	0142+	0143+
0144+	0145+	0146+	0147+
0148+	0149+	0150+	0151+
0152+	0153+	0154+	0155+
0156+	0157+	0158+	0159+
0160+	0161+	0162+	0163+
0164+	0165+	0166+	0167+
0168+	0169+	0170+	0171+
0172+	0173+	0174+	0175+
0176+	0177+	0178+	0179+
0180+	0181+	0182+	0183+
0184+	0185+	0186+	0187+
0188+	0189+	0190+	0191+
0192+	0193+	0194+	0195+
0196+	0197+	0198+	0199+
0200+	0201+	0202+	0203+
0204+	0205+	0206+	0207+
0208+	0209+	0210+	0211+
0212+	0213+	0214+	0215+
0216+	0217+	0218+	0219+
0220+	0221+	0222+	0223+
0224+	0225+	0226+	0227+
0228+	0229+	0230+	0231+
0232+	0233+	0234+	0235+
0236+	0237+	0238+	0239+
0240+	0241+	0242+	0243+
0244+	0245+	0246+	0247+
0248+	0249+	0250+	0251+
0252+	0253+	0254+	0255+
0256+	0257+	0258+	0259+
0260+	0261+	0262+	0263+
0264+	0265+	0266+	0267+
0268+	0269+	0270+	0271+
0272+	0273+	0274+	0275+
0276+	0277+	0278+	0279+
0280+	0281+	0282+	0283+
0284+	0285+	0286+	0287+
0288+	0289+	0290+	0291+
0292+	0293+	0294+	0295+
0296+	0297+	0298+	0299+
0300+	0301+	0302+	0303+
0304+	0305+	0306+	0307+
0308+	0309+	0310+	0311+
0312+	0313+	0314+	0315+
0316+	0317+	0318+	0319+
0320+	0321+	0322+	0323+
0324+	0325+	0326+	0327+
0328+	0329+	0330+	0331+
0332+	0333+	0334+	0335+
0336+	0337+	0338+	0339+
0340+	0341+	0342+	0343+
0344+	0345+	0346+	0347+
0348+	0349+	0350+	0351+
0352+	0353+	0354+	0355+
0356+	0357+	0358+	0359+
0360+	0361+	0362+	0363+
0364+	0365+	0366+	0367+
0368+	0369+	0370+	0371+
0372+	0373+	0374+	0375+
0376+	0377+	0378+	0379+
0380+	0381+	0382+	0383+
0384+	0385+	0386+	0387+
0388+	0389+	0390+	0391+
0392+	0393+	0394+	0395+
0396+	0397+	0398+	0399+
0400+	0401+	0402+	0403+
0404+	0405+	0406+	0407+
0408+	0409+	0410+	0411+
0412+	0413+	0414+	0415+
0416+	0417+	0418+	0419+
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0440+	0441+	0442+	0443+
0444+	0445+	0446+	0447+
0448+	0449+	0450+	0451+
0452+	0453+	0454+	0455+
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0500+	0501+	0502+	0503+
0504+	0505+	0506+	0507+
0508+	0509+	0510+	0511+
0512+	0513+	0514+	0515+
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0536+	0537+	0538+	0539+
0540+	0541+	0542+	0543+
0544+	0545+	0546+	0547+
0548+	0549+	0550+	0551+
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0592+	0593+	0594+	0595+
0596+	0597+	0598+	0599+
0600+	0601+	0602+	0603+
0604+	0605+	0606+	0607+
0608+	0609+	0610+	0611+
0612+	0613+	0614+	0615+
0616+	0617+	0618+	0619+
0620+	0621+	0622+	0623+
0624+	0625+	0626+	0627+
0628+	0629+	0630+	0631+
0632+	0633+	0634+	0635+
0636+	0637+	0638+	0639+
0640+	0641+	0642+	0643+
0644+	0645+	0646+	0647+
0648+	0649+	0650+	0651+
0652+	0653+	0654+	0655+
0656+	0657+	0658+	0659+
0660+	0661+	0662+	0663+
0664+	0665+	0666+	0667+
0668+	0669+	0670+	0671+
0672+	0673+	0674+	0675+
0676+	0677+	0678+	0679+
0680+	0681+	0682+	0683+
0684+	0685+	0686+	0687+
0688+	0689+	0690+	0691+
0692+	0693+	0694+	0695+
0696+	0697+	0698+	0699+
0700+	0701+	0702+	0703+
0704+	0705+	0706+	0707+
0708+	0709+	0710+	0711+
0712+	0713+	0714+	0715+
0716+	0717+	0718+	0719+
0720+	0721+	0722+	0723+
0724+	0725+	0726+	0727+
0728+	0729+	0730+	0731+
0732+	0733+	0734+	0735+
0736+	0737+	0738+	0739+
0740+	0741+	0742+	0743+
0744+	0745+	0746+	0747+
0748+	0749+	0750+	0751+
0752+	0753+	0754+	0755+
0756+	0757+	0758+	0759+
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0792+	0793+	0794+	0795+
0796+	0797+	0798+	0799+
0800+	0801+	0802+	0803+
0804+	0805+	0806+	0807+
0808+	0809+	0810+	0811+
0812+	0813+	0814+	0815+
0816+	0817+	0818+	0819+
0820+	0821+	0822+	0823+
0824+	0825+	0826+	0827+
0828+	0829+	0830+	0831+
0832+	0833+	0834+	0835+
0836+	0837+	0838+	0839+
0840+	0841+	0842+	0843+
0844+	0845+	0846+	0847+
0848+	0849+	0850+	0851+
0852+	0853+	0854+	0855+
0856+	0857+	0858+	0859+
0860+	0861+	0862+	0863+
0864+	0865+	0866+	0867+
0868+	0869+	0870+	0871+
0872+	0873+	0874+	0875+
0876+	0877+	0878+	0879+
0880+	0881+	0882+	0883+
0884+	0885+	0886+	0887+
0888+	0889+	0890+	0891+
0892+	0893+	0894+	0895+
0896+	0897+	0898+	0899+
0900+	0901+	0902+	0903+
0904+	0905+	0906+	0907+
0908+	0909+	0910+	0911+
0912+	0913+	0914+	0915+
0916+	0917+	0918+	0919+
0920+	0921+	0922+	0923+
0924+	0925+	0926+	0927+
0928+	0929+	0930+	0931+
0932+	0933+	0934+	0935+
0936+	0937+	0938+	0939+
0940+	0941+	0942+	0943+
0944+	0945+	0946+	0947+
0948+	0949+	0950+	0951+
0952+	0953+	0954+	0955+
0956+	0957+	0958+	0959+
0960+	0961+	0962+	0963+
0964+	0965+	0966+	0967+
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1012+	1013+	1014+	1015+
1016+	1017+	1018+	1019+
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1024+	1025+	1026+	1027+
1028+	1029+	1030+	1031+
1032+	1033+	1034+	1035+
1036+	1037+	1038+	1039+
1040+	1041+	1042+	1043+
1044+	1045+	1046+	1047+
1048+	1049+	1050+	1051+
1052+	1053+	1054+	1055+
1056+	1057+	1058+	1059+
1060+	1061+	1062+	1063+
1064+	1065+	1066+	1067+
1068+	1069+	1070+	1071+
1072+	1073+	1074+	1075+
1076+	1077+	1078+	1079+
1080+	1081+	1082+	1083+
1084+	1085+	1086+	1087+
1088+	1089+	1090+	1091+
1092+	1093+	1094+	1095+
1096+	1097+	1098+	1099+
1100+	1101+	1102+	1103+
1104+	1105+	1106+	1107+
11			

they are displayed on the screen.

The program will produce a template with sixteen function key labels, but usually only eight are needed, which the program allows for. Any label can be left blank by just pressing (Return) when the label name is asked for. Do not use punctuation marks (commas, full-stops, etc.) and when some graphics characters are not printed properly on the 1320, consult the 1320 User's Manual for more information. The backarrow can be used, and I use it to denote that the function key command includes a RETURN. Confirmation of the label name is required to avoid wasting time and paper. The label descriptions are also displayed just before printing starts to reduce the risk of printing a wrong template.

"The template will remind the user of each function key definition and which key combination to press to obtain it."

Fitting the Template

The paper used in the 1320 is very thin and not satisfactory to use on its own as a key template. To remedy this it should be backed with a piece of stiff card. The surface of the template can be laminated with transparent film to protect the surface from dirt, fingerprints, etc.

Back the template, before it is trimmed to size by fixing it to a piece of card and prick the corners with the point of a pair of compass or something similar as shown in Figure 1. Remove the template and mark the lines joining the holes in the card made with the compass point. Cut the card with a sharp knife in the shape of the template along the marked out lines. Check that the card fits on the keyboard and that there is sufficient clearance for it not to interfere with the operation of the keys. Trim the edges as necessary.

Cut the outside of the paper template and on the inside cut out about 1/16th of an inch inside the lines, making a diagonal cut into the corners.

Cut a rectangle of transparent film

of recommend Tringtransol which is available from W.H. Smiths (about 1" wider and 2" longer than the template). Peel the backing off the film and lay the film sticky-side upwards on a flat surface. Carefully lay the paper template — print-side downwards — on top of film. Cut the corners of the film as shown in Figure 2.

Position the cut-to-shape card

accurately over the paper template and fold the edges of the film over and press on to the back of the card. Next fold the film in the centre cut out. This will hold the paper template securely to the card.

Finally, fit the template to the keyboard and key prints — no more refitting on the key matrix!

See Listings on page 122

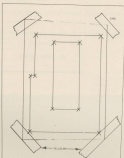


Figure 1: Template placed on card

FIGURE 1

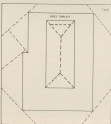
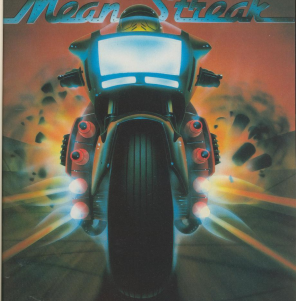


FIGURE 2: Template with film over corners, back.

FIGURE 2

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Soft

Mean Streak



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Zip into the future with this selection of high-tech games from Electronic Arts.

By Tony Hetherington

Space, the final frontier. These are the games that can take you into the unknown as you fight, trade or explore your way across the galaxy. These games cover the whole spectrum of computer gaming from the coin-op contrivances of Nemesis and Quantum, to the adventures of Solcom Decisions and the Hitch Hikers Guide and the strategy of stopping the Ogre or surviving in the Antioch area.

The Hitch Hikers Guide to the Galaxy was originally a radio series, then a TV series and a play, and several books, and finally, thanks to Infocom, an adventure. The result is probably the best adventure you will ever play. It will certainly be the funnest as it combines the humour of Douglas Adams with the usual blend of fiendishly difficult but so obvious (when you eventually solve them) Infocom

Explore New Frontiers

adventures needing to explore new frontiers. Starwardfall is the sequel to the equally puzzling Planetfall in which you're a clerk scuffling through 19th Class university when your space cruiser crashes only to get into deeper trouble. Starwardfall continues the adventure.



Serial

logic problems.

Yes, though as you suffer adventures, will have you excited as you try to find a way past the big blither beast of Tinseltown on improbability drive and try and get some sense out of Marvin the mania depressive robot and many other equally impossible tasks. The game is obviously based on the radio series, and associated books but has a new plot so there's no short cuts for those players who already know what their level is.



Phobos

Leather Goddess of Phobos is an expensive you won't forget as it's a game that you can play at three different levels ranging from tame through suggestive to lewd. Your mission is to stop the Leather Goddess fiendish plan to reduce the Earthmen to a state of raw slaves and to help you out you'll find a 3D comic to read and in the best 3D graphics to read and an intriguing scratch and sniff card! Some of the other games can still be found at incredibly low prices such as Starstorm and the weird and wonderful Suspended which can you in suspended animation and your only way to explore and save an impending disaster is by controlling six very peculiar robots.



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Futuristic Graphics

On this side of the pond, only Level 9 have stemmed the infocom tide with their own trilogy of futuristic adventures now marketed by Rainbird as *Future Dreams*. These adventures packed with illustrations and text descriptions to match, tell the tale of Kim Kimberly and his descendant who are caught up in the colonization of the Planet Etern.

The saga begins on the colonization ship in Snowball where you find trouble. In *Return to Etern* you must escape the arriving crew of the Snowball (I told you there was trouble) and find the robot city of Etern only to find in the final part the *Worm in Paradise* that there is something desperately wrong with this robot colonial city. The robots have taken over!



Quantum

Activision's *Portal* is described as a computer novel in which you return from a failed 100 year mission to find that all the people have gone. Who? Using *Homert*, a biological computer, that's providing water and wonder you must piece together the story before it's too late.

Activision also have the distinction of being the only company to produce two different games based on the same film sequel - *Alien*. The American company produced a multi-game version that follows the plot of the film with stages representing the scenes in the film where the dropship

lands on the planet, the rescue attempt to free the trapped marines, you hold off hordes of aliens as the team set their way out of the operations room, a mad scramble through the air ducts, a race against time to find and rescue newt and the final duel with the Alien queen.

Meanwhile, *Electric Dreams* (part of Activision UK's then its own version that captures the atmosphere of the film but not the actual plot. Your mission is to guide your survivors through the rooms of the Alien infested complex. The action is tense and incredibly exciting.

Carrying up a Bad Game?

In that accolade the science fiction action is truly more than left/right/fire games in which an unbelievable variety of aliens are destroyed by players of countless games. In fact the science fiction label is stuck onto the strangest games usually to cover up a poor game or refresh and revitalize a rehash of an old one. For example, *Archon* is an exceptional rewrite of the original *Breakout* but it's hardly science fiction. Two exceptions to this are *Quantum* and *Nemesis*.

Quantum is the sci-fi equivalent of *Quartet* except that it's a side on scrolling game controlled by *Electric Dreams* in which the player selects one of the game's four characters to fight their way through the screen.

Nemesis (Konami) is one of the best coin-op conversions as well as being a top shoot-em-up where your ship and your chances of success get better as you blast the enemy until finally you have a high speed crash armed with lasers and missiles as well as two laser firing remotes.

Rainbird's *Starfighter* is one of the few games to make the transition from computer to arcade as more and more players grapple with the vector graphic tanks, mainly tankbusters, shooters, walkers and flying starfighters to arrange the occupation of the planet *Nemesis*.

A though *Starfighter* has made the breakthrough it could have happened to any number of quality shoot-em-ups such as *Neugier's Mercenary*, *ORL's Tan Cuts* (the C64 disk version is incredibly), *Atari's Trap and*, of course, *Elite* (*Firebird*) and *Heaven's Orbits*. *Elite* and *Orbits* were games that rapidly set standards that other games had to beat (but also copied) and will always remain two of my favourite games.

Brain Power Wins

Firebird has since followed up its client success with the double act of *Choko* and *Sentinel*. *Sentinel* is an incredible game in which you must use your brain and your reflexes to defeat the *Sentinel* over a staggering 10,000 backgrounds. The *Sentinel* stands on top of the highest peak in each of these lands and absorbs all excess energy. Your task is to teleport them when shell to robot shell until you can strike at the *Sentinel* while avoiding the *Sentinel*'s deadly draining stars.

In *Choko* you're just realized that mankind is trapped underground. The robots were supposed to let you out since the radiation levels had subsided. Now you have only one chance of escape as you've managed to regain control of a general purpose robot called *Choko*. If you use him well and don't make too many mistakes you may be able to recruit more robots to fight the rebels. *Choko* is a little slow



Sentinel

compared to other games, but once you're into it you're hooked.

The hardest wiffi game has got to be *Accolades* (imported by US Gold's Pro-5 Trading Company). The game has some impressive graphics and an easy game system. I can even cope with selecting a crew from the 30 galactic oddballs that you get to choose from but I always seem to get blown up and plundered by pirates on my first trading flight! Has anyone finished it?



Accolades

Ogre is set to be the next computerised board game to follow *Antaroid* and will be a strategy science fiction wargame between two sides. One side must defend a command post with a force of tanks, infantry, howitzers and GUY's (Of course!), the other side has only one piece. That piece is the *Ogre*, a living cybernetic supertank, armed with massive guns, anti-personnel mines and missiles. If you can't wait for the computer version you may still be able to track down the original board game. If you find it, buy it!

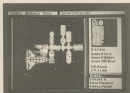
Antaroid (Origin Systems via Microprose) casts you into the strange role playing world of *Car Wars*. It's hard enough to survive in a world where you must build, armour and pile weapons onto custom cars that then either plug it out in arenas or battle on the open road. As you get the smell of petrol, smoke and blood in your nostrils you'll want to drive on until you're the best. Drive offensively, the life you save could be your own!



Electronic Arts, the latest US software house to set up shop in the UK, have just released *DOS* (Earth Orbit Station). Seven missions drive 1-6 players deeper and deeper into space as they compete to build bigger, better and more profitable space stations.

Depending on the scenario which range from building a dry dock in Earth Orbit to a race to scratch for life you will have set number of turns or quarters to build set space stations or race to have the highest technology level. Whatever the mission your first priority is make as much money as you can to be able to fund the target projects.

Every space station needs a command centre and logistics module and there is more power plants, life modules and galleys to provide the people, power and support for any of the money making or research getting installations such as spaceports, chemical labs, weather or



communications satellites, forestry labs or space taps. As you make more and more money (hopefully!) you can turn some of your modules from commerce to research and build up your tech level which may earn you victory points and allow you access to the most complex and profitable modules.

A successful player will also have to play the markets and set as high a price as he thinks he can get for the goods created by his modules. Get this right and you can get ahead in the space race.

The game is played through a selection of menus between 2-4 players that can human or computer opponents. It's easy to learn but can be tricky to play particularly when you're trying to judge how many life, power and galley points you need to install a new module.

Finalities

Title: *DOS*. **Supplier:** Electronic Arts. **Supply:** *Business Centre*, 11-19 Norton Road, Langley, Av. Munch, Bucks MK12 7FN. Tel: (07531) 49442. **Machine:** C64. **Price:** £79.95 (shd.). **Originality:** 8/10. **Playability:** 8/10. **Graphics:** 6/10. **Value:** 7/10.

Finally, over a year since its announcement we are still waiting for *Star Trek* – the game. Beyond's stand at last year's PCW show was built to look like the bridge of the Enterprise. I have played the Atari ST version (which is expected to be out down in the next few months) but all Beyond will say about the C64 version is it's being done!

Contributions

So you own a Commodore? So you've written some programmes? So why haven't you sent them to us?

Your Commodore is always on the look out for new programmes, hints and tips, articles and even regular series. In fact if you have something that you think could be of use to other Commodore owners we want to hear about it.

So if you have got something which you think we may be interested in. How do you go about submitting it to us?

Below you will find a lot of guidelines that will help us to deal with any item that you send us to us. We don't expect everybody to be the next William Shakespeare, but if you do follow these simple rules then it will make our job a lot easier.

1) If possible all material sent to the magazine should be typed or printed out on a computer printer.

2) All text should be double spaced i.e. there should be a blank line between each line of text. You should also leave a margin of about 10 characters around the text.

3) On the very first page you should put the following:

Name of the article
Machine that it is for
Any extra required - disk, printer etc.
Your name
Your address
Your telephone number

4) The top of every page should have the following information on it:
Abbreviation of the article title
Your name
The page number

For example, suppose you had submitted an article on C64 interrupts. You should put something like the following at the head of the page:

Interrupts / J Smith / 1

5) Please make sure that you do not make any additional marks on your text especially underlining.

6) Try and write in clear concise English. It does not have to be a work of literature but it must be comprehensible.

7) On the bottom of each page you should put the word **END** if there are more pages to the article or **ENDS** if it is the last page.

8) If possible, enclose a listing of all programmes.

9) Under no circumstances are a staple to hold the pages together. Use a paperclip instead.

10) Programmes should be included on either disk or tape. Make sure that you **SAVE** two copies of every program so that we have a better chance of loading them if problems occur.

11) Programmes under 10 lines can be included in the text. If your program is longer than this you must include a disk or cassette.

12) If your article needs any artwork then supply clear examples of what is needed. We don't expect you to be an artist but we do need to see what is required.

13) Photographs, if necessary, must be either black and white prints or colour slides. We can take shots ourselves so don't worry about this too much.

14) Submissions of any length are welcome. If you have a five line routine that you think may be of use to someone else we welcome it just as much as a full blown six part series.

15) Payment varies quite a lot and depends on quite a number of factors, such as complexity of program, presentation of program, number of magazine pages it takes up etc. Payment is generally between £50.00 and £200.00.

16) All payments are made in the month that the magazine containing your article has appeared in print.

17) If we do find your submission suitable for inclusion in the magazine we will write to you giving the terms of publication, the rate of payment and an agreement form. Prompt return of this form will allow us to use your program as soon as possible.

18) If you want the program returning to you, should we find it unsuitable for publication, then you should enclose a stamped self addressed envelope.

19) If you use a wordprocessor then enclose a copy of your text on the disk and state clearly which wordprocessor you use.

20) Send your programmes/articles to:
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21) Your Commodore cannot accept any responsibility for items sent to the magazine.

The ICPUG Column

With the growing popularity of the Amiga, many ICPUG members are using their utilities for both the Amiga and the Commodore, which can lead to problems.

By Tim Arnot

Well, now that we've got the introductions out of the way, and the commode...oops, Commodore share report, we can get down to what this column is really all about. Namely, why hangin' in here sucks (what?).

ICPUG's membership covers the whole spectrum of Commodore computers from the early KIM-1 through VICs, 64s, 128s and Amigas. In our bi-monthly newsletter-column-journal, we try to reflect this wide range of interests. However, we can only print what our contributors write, and so this policy does not always work.

At a recent committee meeting, it was stated that 75% of enquiries we are receiving are from people who already have or are seriously considering buying an Amiga 500. This leads me to think that in maybe a year or two, the 64 and 128 will be reduced to the historical status of the PET and VIC. Indeed, the stated presence of 8-bit products at the recent PET show (as in a Amiga show?) would tend to confirm this.

Before that happens, there will be a transition period, when people are using both technologies. As they move

from 8 to 16-bits, they are likely to want to take their wordprocessors, spreadsheet and database files with them. This is the problem which I will expand upon this month.

Compatibility Problems

The first problem comes when you take your data disk out of the 1241 and insert it into the Amiga's internal disk slot - it won't fit. Commodore's engineers, normally very clever people, seem to have made the hole too small. Being resourceful people, they made the diskette fit by reducing their size. Unfortunately the media now falls out, and the protective cover just disintegrates!

Thus, they produced a stronger, plastic jacket for this smaller disk, and for good measure, threw in a metal shutter to protect the surface from baby and the cat. This polished casing also stops people from flipping the disk, a deplorable practice anyway, as it sure got my 1571 confused! Then, to add insult to injury, they did away with that nice G.C.R. recording system that we're all used to, and started to use

some alien mush called M.F.M. Just because every other jack computer uses it, it is no reason for Commodore to start.

OK, so we're got to get our stored information from the 1241 onto a disk which is the wrong size, records in a foreign language and has a strange directory structure. We might also have to convert from PETSCII or screen codes to ASCII, but given a small amount of programming expertise, that's not a real problem. Presuming we know that the 64 will read the 5.25" disk and the Amiga will write the 3.5" disk, all we have to do is make the 64 tell the Amiga what's on the disk. You could also go the other way if you wish.

For instance if you use an Amiga word processor and want to upload text onto a bulletin board using the Compuser modems, the way to do this is best summed up in one word. Async. (ardon't) Yes, Async.

Async stands for ASYNchronous communications, and is normally associated with sending and receiving data through the serial port. By this, I mean the RS232 port, not the Commodore serial bus, which is a

standardised form of the IEEE-488 parallel standard.

Guess what? Commodore failed to implement RS-232C properly on the 64 and 128. Plus/4 owners are lucky in that respect as they have true RS-232 right up to 19K baud. So some sort of interface is needed. Examples of these can be found by looking through adverts in this and other magazines. I personally recommend the interface made by Brain Boxes (£49.95, 051-280-2905).

You will need to connect the RS-232 ports in a configuration known as a 'null modem' (fig. 1). Basically this makes each computer think it is driving a modem and not another computer. Refer to the computer's technical manuals for the pinouts of the serial ports.

Rather than writing your own software for transferring the files from one machine to the other, there is a public domain file transfer program available which makes it relatively easy.

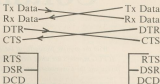
This is called 'Kermit', and is

available for virtually every personal computer under the sun. We certainly have it in all the ICPCUG libraries. Before you ask, yes it was named after

a small and lovable green frog!

So, connect the cables, boot up the software, transfer the files and life will be easy. Or will it? TM

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Games Reviews

Need some advice on the new releases? Then cast your eye over the latest batch of games.



Pegasus

You've flown a plane, taken a helicopter gunship for a spin, dived to the depths in a submarine and gone on patrol in a destroyer. Now here's your chance to fly across the waves in a hydrofoil.

This isn't going to be a joyride as you're at the controls of the PHM Pegasus. It's one of the heavily armed patrol boats like those on service with the NATO allies USA, Italy, and Israel and it's your job to complete one of the eight assigned missions. These range from target practice (although even these shoot back) to the highly topical but almost impossible job of escorting a supply ship from Kuwait, through the Persian gulf to the safety of the open sea! The only trouble is that the Gulf has become a war zone and ships are being attacked indiscriminately.

To carry out your mission you'll have to master the controls and weaponry of the Pegasus so you can react to any threat quickly and decisively. And at the same time, control the overall strategy of the mission as well as two search helicopters and the supply ships from a separate map screen.

The map screen is used to plot your course and speed as well as those for the helicopter and supply ship. Then you sit back and wait for the action. You don't have so much time for you can speed up the game clock by 120 times normal speed! As enemy ships will soon be picked out by hydrofoil and helicopter radar screens. As soon as you see a ship you have to manual controls and the instrument screen that shows fuel, speed, compass, radar and weapons gauges as well as a HUD view ahead and above that an enlarged binocular view of any locked on target. When the target is in range you can either take it out from a distance with a guided missile or try out your shoot skills with the 70mm water cooled naval gun. Either way you haven't got much time as other ships will soon be in the area.

Pegasus lacks some of the detail of other simulations such as Gunship and Silent Service, however it does compensate for that in action. Another reason for your collection of combat simulations.

T.H.

Filename: Pegasus, **Supplier:** Electronic Arts, **Luxury Business Center, 11-49 Sutton Road, Nr. Slough, Berks SL3 7JH, Tel: (0515) 61611, Machines: C64.**

Originality: 7/10 **Playability:** 8/10 **Graphics:** 8/10 **Value:** 7/10

Black Magic

In a time of hapless warlocks and evil wizards, many moons before the civilised man came to be, class was a word not known and honour was judged by magical status. As you can imagine, it wasn't very nice being a normal person, being turned into a one-eyed dancing polar-bear, for the wizard's amusement, and then left to dance around the village, only to be caught by the local fat coast rucker - not very funny.

Anyway on with the real plot. You are, as it were, a normal person - a resident in the once peaceful village of Harigold.



The once lush green fields are now misty cemeteries where the bodies of Zargrim's 11 Thorne to him in a minute's victims are dumped. The towns are deserted and only the demons occupy the once happy homesteads.

This makes you very sad and angry (two good). The last straw comes when Zargrim, the evil warlock of great power, kills your magic tutor, who taught you all that he knows. (Which wasn't very much as Zargrim had nicked all the magic books). So filled with anger you set off to kill the mighty Zargrim, but as you pack your rucksack you discover an old dusty parchment that tells the story of a wise old man called Anakeer, who was defeated by Zargrim and then had his eyes nicked (yes, so) and placed randomly around the land so he could watch in vain as the land decayed and crumbled.

You decide to find Anakeer's six eyes and place them back in the sockets (pragmatically). Anakeer, by the way, has been turned into a statue, hidden away in the wilderness by Zargrim.

Well, what's the game like? Very good indeed. I haven't stopped playing it yet. Okay, the graphics are a little dodgy and sometimes dull, but the game is brilliant, with more spot effects and a huge playing area. The type of game is new to me as I'm more of an arcade freak myself, but I just hope that US Gold make a follow-up to it, and then a follow-up to that. Well, stop being very not nice and get this game, you won't be sorry.

J.R.

Developer: Black Magic. **Supplier:** US Gold, 1000 1/2 Bedford Way, Hatfield, Herts AL9 9NA. **Tel:** 021-236 2388. **Machines:** C&A. **Price:** £9.99 (C&A: £14.99) (R&B). **Originality:** 5/10. **Playability:** 9/10. **Graphics:** 5/10. **Value:** 8/10.

Centurions

Most of you kids out there must have seen that new American cartoon, The Centurions, those space-age super heroes who fly high above the earth observing life on earth. And whenever something bad happens they beam down to our humble planet and zap the bad guys.

Well, it had to happen sooner or later didn't it – the cartoon of the toys of the game and so on. The idea behind

the game is this, the evil Doc Terror plans to get his dirty hands on a deadly nerve gas, which is hidden in the centre of a high security complex, throughout the complex there are masses of doors which are all locked, and all need a special key to open it.

You and your centaurian pals have to get into the complex's heart, locate the nerve gas and keep it safe from the Doc, searchers may, doesn't it? Well I've seen the map for the level and it's huge, and one thing's for sure – it'll keep you busy for a long time.

At the start of the game you can choose one of the following characters – Jake, Ace and Max. Each have different skills, such as skills in the air, land and sea. You start off as a droid and must choose which skill you want.

Through-out the game there are patches of sea, air and land, in the middle of which are keys. So, if you are in sea mode and need a key that is surrounded by air (!) then you will have to go all the way back to the start and change your mode! The doors show which key is needed to open them by the keyhole, i.e. a door with a round hole will need a round key to open it.



This game is a little bit like Gauntlet where you can have two players involved at the same time. You can also collect various weapons as when you have shot a certain amount of enemies power-up bonuses start to appear. On collecting these you are given a three-machine type chance to pick a weapon, prize your location and a letter will be selected, with each letter being a different weapon and if you are lucky enough to get 'A' you will get extra strength and a random weapon.

Although there are only three ways to this game, they are so comprehensive that they are more than enough.

I wouldn't say this was a game for shoot-em-up freaks, as it involves a lot of thinking and memory, with a fair bit of blasting as well. Yet another playable and polished game from the main man Mr Crowther. Well, don't just sit there picking your nose, go and buy this game, it'll keep you busy for weeks on end.

J.R.

Developer: Vide. **Centurions.** **Supplier:** Atarisoft, 68 Long Acre, Clonsilla Garden London, WC2E 8AN. **Tel:** 01-838 3411. **Machines:** C&A. **Price:** £9.99. **Originality:** 5/10. **Playability:** 8/10. **Graphics:** 8/10. **Value:** 8/10.



Living Daylights

After the release of *View to a Kill*, I approached this latest title with an open mind. No doubt you have seen or at least heard of the new Bond film, the *Living Daylights*, if you haven't, sit tight.

You play the part of James Bond on a mission to rescue the lovely Kara and help a fellow agent General Koskov. But as you know, this will be no easy task.

You start the game in Gibraltar, training with the SAS. They conceal themselves behind rocks and jump on randomly and shoot you - don't worry though, it's only point points. But somewhere on this level hides an enemy agent out to kill you, kill him and you will be taken to the next level.

Before entering the second level you are asked to choose a weapon from a list of four. Make sure you choose the right weapon though. Here it's just more of the same shoot-the-baddies, but not Joe Public - if you do shoot a passer by you'll lose points and a 'whoops' sound is played. This would have been better if when you shot an innocent person a blood curdling scream was heard (Friday the 13th style) and it would certainly get you off shooting any more Jews.

You play the game over eight levels, with increasing difficulty, but as I said before this game is almost the same all the way through. Just shooting, jumping and dodging, but don't get me wrong, it's not a bad game at all, if it was 'a bit more varied, it might have got very high marks. But as it stands, it is a playable game that is let down by repetitive levels. It's a shame though, there were so many things that could have been put in, for instance a lively car chase with multiple weapons.

Oh well, there you have it, a great license that could have been brilliant, but unfortunately is only average.

R.R.

Finalities:

Price: *Living Daylights*. Supplier: Demarc, Denmark House, 22 Maryfield Road, Widdowson, Canals, SW16 1TA. Tel: 01-819 5812. *Machine:* C64. *Price:* £9.95/\$24.95 (Dink). *Originality:* 3/5. *Playability:* 3/5. *Graphics:* 3/5. *Value:* 3/5.

Epps Epics

Whenver a magazine does a retrospective of great Commodore blasts from the past you can guarantee that *Impossible Mission* will be mentioned somewhere. Now you can add it to your collection and have *Summer Games*, *Pinop* II and *Breakdance* added to the bargain. Yes, it's a big value time from US Gold with their latest compilation *Epps Epics*.

Few American companies can boast the string of successes enjoyed by this Californian team and, with the exception of *Breakdance*, this is a collection of their golden Old memories.

I admit that *Pinop* is perhaps showing its age, if only from the technical point that *Grand Prix* uses no longer permit retarding stops. As a racing simulation it still has the novel approach of fuel and tyre watching to recommend it over other Pole Position spin-offs. In addition there are six real international events to choose from, either three, six or nine lap durations and three skill levels.

Playing at Pro level against the computer is almost impossible but you can always drag in a friend to play against you. Could *Pinop* II's re-release have something to do with bigger plans from US Gold? Watch this space... even better read the news pages.

In case you're forgotten, *Summer Games* is the one with



pole vaulting, diving, the crippling 4 x 400 metre relay, the 800 metre dash, gymnastics, freestyle swimming (100 metres and relay) and shoot shooting. Eight events in all to test your endurance, skill and speed. This is the one that started the *Epps* sports craze which has now taken in *Summer Games II*, *Winter Games*, *World Games* and the new *California Games*. I hope we'll see the rest of them on compilation soon.

For me, *Impossible Mission* is the next best thing. It has everything from simple but tricky gameplay through to the deeper level of puzzle solving. Add to this unsurpassed value synthesis with magnificently animated graphics and I think you'll agree this is the ultimate. With rumours that *Impossible Mission II* will be appearing soon I may have to revise my opinions, but until then this is the showpiece.

Even Elton Nymander has a plan to destroy the world and several agents have been lost trying to foil his plot. Elton

has locked himself away inside his underground stronghold and the stolen keys to his treasure are scattered in pieces inside the furniture. Guardian robots will make sure that you won't get the codes easily as you race against time to defeat the mad professor.

When I first heard that *Breakdance* was being written I thought it would be awful but I was wrong - it's dull. A lot of effort went into trying to create an interesting game but it's basically a dance version of the Simple Simon music game.

There are four elements to the full game. In the first you match the moves of Hot Feet, the local hero. Then you try to outdance the Rocker Crew who try to dance you into the river. The third challenge is against the Breakdancing king and in the final phase you can build up your own dance.

At £9.99 for the collection, the relative cost per game is about £2.50. At this price it should be in everybody's library if you really are missing out.

E.B.

Touchline

Name: *Touchline*. Specs: *Amiga 500/600, Spectrum, MSX, Gold, Vint 2/3*. Platform: *Way, Wayford, Birmingham B6 2LE. Tel: 021-334 3368. Machines: C64, Price: £9.99.* Originality: *8/10. Playability: 9/10. Graphics: 6/10. Value: 10/10.*



Defender of the Crown

There I was, sorting the mail, press releases and final demands on payment for our edition: *handover* for HPs, when out of an envelope came *Defender Of The Crown*. 'Yeah, great' I shouted with glee and carefully studied it in the dim glow. After a few minutes and clicks a nice title screen appeared with glistering initial and smart music. I knew then, I was in for a treat.

I'm sure most of you have heard of this game which grabbed the headlines of most magazines for its wonderful graphics and music.

The game is set in the 12th century in days of old when knights were bold and all that stuff. You can choose from a list of characters who are different skills ie. some are good leaders but poor at sword fighting or could be good at

poasting but a greedy leader - it varies.

After the title screen and 'tutorials' have gone you will be asked to choose the character you want by pushing left and right on the joystick and a picture of the character and their abilities will be shown.

This done, it's on to the game. You are represented by a black shield on the map, which incidently is where a lot of the game play takes place. You can transfer men from your home garrison to an army which you can place on a plot of land. When your move is over the computer then takes control of the other five players and so on.

Moves available to you are either to go raiding, where you can visit a local or not so local castle and attempt to steal their gold, but being of Saxon blood it's best to pick a Norman castle. First you have to fight your way past two guards, and if you have picked a poor overman you stand a good chance of losing.

I must mention the shadows that appear on the walls as you fight the guard inside the castle, as they are especially well done. You can also call your men into provided you have the cash. After you call a lieutenant you are asked if you would like to go for fame or for land. If you lose the battle and you choose fame your leadership rating will be reduced, or a piece of land lost depending on what you gambled for. If you do manage to win the game you are greeted by cheers from the crowd and on your third win a nice little piece comes up on screen showing you on your home being presented with a prize from the King.

My favourite part of the game is the love scene. You are alerted by the wailing of a Saxon maid, and two options are available to you - either rescue or ignore her. If you manage to rescue her you will be greeted by an innocent-looking maid, who flutters her eye-lids at you. As you close in, she takes her clothes off (you'll go blind) E.D. and last but not least you take her in your arms and give her a big smacker on the lips.

After that excitement you are then rewarded with her hand in marriage and the joining of the two kingdoms. However, if you ignore her, you are a coward.

My other favourite scene is the siege. Here (provided you have a catapult) you must attempt to knock down the enemies castle wall with boulders, but this is quite tricky as you have limited boulders and each shot fired is a day gone by. Bombs and burning pots of molten you are also an hand for reducing the enemies army, but to get them over the wall you have to shorten the wall. You will then go into battle and the player with the most men gets the castle.

All battle scenes and their outcomes depend on how many men you have and what strategies you use. You could try and outthink your opponent with your leadership or choose to just stand and fight among many other options.

Playing *Defender of the Crown* was a joy, there are so many options open that each game you play is almost different. The love scene for example is random - you never know when it's going to appear, so if you were out of cash, and a fair maiden needs rescuing it could be a good chance to bump up your riches. The graphics are also quite breathtaking and really build an atmosphere, though a lot of them are not animated. The music, well this is very good, loads of different tunes for each part of the game and very medieval too.

My only minor about the game is the various bugs which occur now and again. For example you could place five men in an army, then suddenly have twenty, but the small bugs

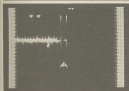
don't really spend the game. It just gives the slight feeling that you are not in control of the game. However this is no reason not to buy the game, and quite frankly you would be a fool if you didn't.

R.M.

Touchline:

Title: *Defender Of The Crown*. **Supplier:** *Miramax*. **Atmos:** *Peace, 96-97*. **Shot Long:** *London, ECW 44K*. **Tel:** 01-277 4041. **Marketing:** *C&A, Price: £14.95 (list only).*

Originality: 9/10. **Playability:** 9/10. **Graphics:** 10/10. **Value:** 9/10.



Laceforce

One thing you are guaranteed from a quality budget range is a good choice of shoot-em-ups. Code Masters latest game is a block-busting blast consisting of several mini game parcels of old-time ups combined in a new and fresh way.

The rules are simple - survive! As the pilot of a delta shaped starfighter you have to negotiate 12 levels of Hell, with each level consisting of four terrain chambers.

The first challenge is reminiscent of a stage of Salamander, the arcade classic. Tongues of flame reach out to lock round your delta and like-mouth crabs. As the screen scrolls relentlessly down it reveals an amazing assortment of gun fodder attacking in myriad ways. From behind come the back-wind firing attackers, mean machines who can't fire at obstacles in their path. It's all happening at once, it's hot, sticky, frantic action. Make contact with a WOP (who he?), you double fire power, is increased to triple power and you can really give the enemy a roasting.

Another weapon in your armory is the Energy Discharge Bomb which destabilises the kinetic energy of the aircraft and supersedes them all. Your store of EDBs is limited to use them wisely.

Assuming you survive, you meet the Guardian Zone, which is a Centipede style game, only four times more frenetic. Still the attack waves descend towards your small scrap of a ship but now centipedes appear spilling down towards you through the mushroom shaped space debris. Here again you can order the use of WOPs and EDBs.

Now the calm comes after this storm as you dock with your mother ship to refuel and gain bonus points for success.

These points can be increased as you pass through the non-related tunnel. If you crash in either of these phases you will not lose a life, so be as daring as you like.

Here ends the first level and although the rest of the game follows the same pattern the style changes. Level Two starts with mechanical arms reaching out and blocking your path, making you swerve like crazy to avoid collision. Level Three has bubbles which don't move but have to be dodged around as you zip along on your way.

Laceforce is the best game of its type that I have seen in a long time. If Jeff Minter wants to relinquish his crown as King Zap, Gavin Rishman is a worthy successor. So much for so little, what a bargain!

R.D.

Touchline:

Name: *Laceforce*. **Supplier:** *Code Masters, 1 Brunson Business Centre, Brunson Close, Banbury, Oxon, OX18 1AT*. **Marketing:** *C&A, Price: £1.99.*

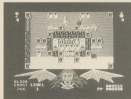
Originality: 10/10. **Playability:** 10/10. **Graphics:** 9/10. **Value:** 9/10.

The Astonishing Adventures of Mr Worms and The She Vampires

At first glance there is more than a passing resemblance between this game and *Electric Dreams*/Dandy. Not surprising, really because they're both sourced by the popular but ever so slightly whacky Ban Jam Corporation. This bunch have been on the games scene since the year dot for the most part hiding behind larger companies such as *Electric Dreams* and *Musik*, but this time working for themselves.

Mr Worms is set in the distant past when there were two kinds of living dead - Vampires and Chartered Accountants. The only similarity between these breeds is their blood-sucking ways. Nowadays there are only CA's and this game provides a possible answer to the question of how the Vampires went into a decline.

Worms is not a run-of-the-mill accountant, he is a failed run-of-the-mill accountant. After firing with a heady



alternative career as a lion tamer, circus life lost its bite and so he turned to vampire hunting. Armed with a rapid-fire garlic gun and a single smart garlic pill we join our old friend in his greatest moment.

Deep in a Transylvanian chateau the She Vampires and their cohorts are out for blood as they stalk Mr. Wooms. Necessarily, Wooms blasts bats, Frankenstein monsters and even She Vampires with the same kind of detached indifference which he adopts when he bats apes or figures in Company lodgers. This time it's his blood count which interests him, if it falls to zero so does he!

Hidden around the enormous house are keys to rooms and secret passages. Vials of precious blood will replenish his fading health and garlic bombs help to clear screen-upon-screen of hordes.

Wooms can blast away the corpulent vampires permanently if he drains away all of the nasties in a particular area. This renders the anti-generating tanks vulnerable to his attacks. Each tank-free room becomes permanently exercised, but just one unscaled generator will blood many vampires of the night when Wooms returns.

A floor crisscrossing five floors of demons, Wooms faces the wrath of the Great She Vampire. If he has the tools he'll finish the job, if he is ill-equipped the She Vampire will prevail.

At first I thought this was just another Clusitel clone but it has a uniqueness which won't wear in the end. On the credit side, the game possesses that old and come again appeal which the fantastic original failed to deliver. In the debit column is the Spectravision style of graphics (but not as ghastly ghastly as Dandy).

I think the similarity between Dandy and Mr. Wooms may have an adverse effect on sales that even a silly title will fail to counteract. The cover illustration was my vote as the worst I have seen in a long time. A shame really because Mr. Wooms shows a vast refinement of style over its predecessor and deserves to win a larger audience.

E.R.

Touchline

Name: *The Astonishing Adventures of Mr. Wooms and the She Vampires*. **Suppliers:** Phoenix, 4 Little Essex Street, London WC2R 3JF. Tel: 01-438 6621. **Machines:** C&A. **Price:** £8.95. **Originality:** 4/10. **Playability:** 9/10. **Graphics:** 7/10. **Value:** 4/10.

Mermaid Madness

Once upon a time there was a really ugly, old, cat-bag-faced mermaid called Myrtle, who thought that at the ripe old age of a hundred and ten, she would be left on the shelf. So there she was sitting on the pier feeling sorry for herself, when up comes a dapper sea diver by the name of Casanova Colin. With stars in his eyes she decides that this is her man and promptly tries to grab him. Colin may be stupid, but not that stupid and he dives quickly off the pier to avoid her ogres arms. Foolishly however, he hides under a sunbed boat and gets trapped. Myrtle the Mermaid is horrified and sets out to rescue Colin.

This is where you take over - you must guide Myrtle, who



can walk on land as well as swim in the sea, who will need to collect various objects, in order to progress. For example, you must find the dynamite to blow up rocks that block your path, find the net for the strange ancles, and collect bottles of stail to keep your energy levels up. Also you have to keep an eye on your heart, as this beats faster the closer you get to Colin.

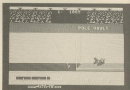
There are various sea creatures throughout the game and any contact with these will reduce your energy little by little.

If you do not already have this game (it was released a while back by Electric Dreams) then go out and get it, as for £1.99 it's good value. I must mention the music which is also quite jolly.

K.R.

Touchline

Name: *Mermaid Madness*. **Supplier:** Firebird, 64-76 New Oxford Street, London WC1A 1PS. **Price:** £3.99. **Originality:** 4/10. **Playability:** 4/10. **Graphics:** 7/10. **Value:** 7/10.



Devotion

Joytick niggling can prove to be a very tiring affair. This is especially true when you have to keep it up for some time

minutes non-stop in order to compete in the 1500 metres, the last event in the Decathlon. Originally released by Activision, Pitchbird have given the game a new lease of life at a budget price.

The events can be divided roughly into two sections - brute force and timing. There are three running events, 100, 400 and 1500 metres and you must keep the joystick moving from side to side just as fast as your hands will let you. In the other events, not only must you run up quickly, but you have to press the fire button to jump or throw.

Up to four players can take part simultaneously either in all ten events or just one. Points are awarded on the basis of your performance - the longer you throw the javelin, the better you score and so in real life, you soon discover that different people have different strengths and weaknesses.

Graphically, the game looks crude but that is irrelevant. Decathlon plays superbly. It was one of the first multiple-event type of game to be released and still stands the test of time. Superb value at under two pounds.

G.R.H.

Touchline:

Title: Decathlon. **Supplier:** Pitchbird Silver, First Floor, 44-76 New Oxford Street, London WC1A 1PS. Tel: 01-376 6715. **Machine:** C64. **Price:** £1.99. **Originality:** 5/10. **Playability:** 9/10. **Graphics:** 4/10. **Value:** 10/10.



Clean Up Service

Mr McStevens, owner of the Adèle Hotel has a little problem which is so bad, he can't keep his staff for long. What he needs is a hard-working person who can restore normality and the Hotel's reputation. Instead he employs Otto and Robbun, a pair of shirkers desperate for work after they exploy in Clean Up Time.

The instructions to this offering are non-existent, a deplorable habit which is common in the budget world. It took some time before I could work out what the game was all about. It was only when I discovered that there is a box of goodies on the screen that I started to understand the nature of the game. By rummaging in the box you find a gun, a

brush and a bin lid which help to eradicate the litter bugs who run from floor to floor.

In the impossibly difficult one player game Robbun sleeps upstairs as Otto dashes about in a futile attempt to rid the hotel of louts. The two player version brings Robbun into battle and the possibility of success becomes more feasible.

The louts emerge from several bins in the hotel, and the first task is to select which bin it is best to close to keep the louts at bay. Once a lid has been placed on the bin the real clean up begins.

Armed with the gun and a brush the team can limit the amount of litter the louts spread until all the rubbish is removed. On subsequent levels the creatures and the aims change - in the kitchen make a hamburger, go fire fighting, and beat the wind. In all, there are eight levels, more than enough for an excellent value budget game.

This is a graphically interesting game and, in two player mode, the game is tricky, challenging and enjoyable. As a one player game it's a non-starter. If your social group includes another computer freak with his own joystick you could do a lot worse than to buy this co-operation game. If you are a secret Commisive barker send Clean Up 80 price at all costs.

E.D.

Touchline:

Name: Clean Up Service. **Supplier:** Playarc. Tel: 07-535 77155. **Machine:** C64. **Price:** £1.99. **Originality:** 5/10. **Playability:** 7/10. **Graphics:** 5/10. **Value:** 9/10.



Street Games - Baseball

If you're anything like me your experience of baseball games would be one of bunting against the odds, and considering a twenty to seven defeat as being a pretty good achievement.

Egypt's Street Sports version of baseball from US Gold is the exception to the rule, allowing plenty of interaction before and during the game. There is plenty of opportunity to improve your team's performance and the excellent graphics and gameplay make it the best simulation that I've seen so far.

There are sixteen kids on 52nd Street and all of them want to play. As captain you have to use your skill to select the best possible team. Each captain takes a turn and then you have the option of winning your own batting order and field positions before the game begins.

None of the kids are great all-rounders and this makes the team selection a fascinating part of the game. John, for example, throws better than most of the boys on the team, but is lousy when it comes to batting. David, on the other hand, bats like a demon but makes a second-rate fielder. The skill of choosing is to select a team which covers its own failings as far as possible.

When the actual game begins you have a large degree to control over the action. You even choose whether you play on lawns or grass. When batting, your only worries are when to hit the ball and when to leave it alone. Timing of your stroke is important and not too difficult to master because you are given perspective and overhead views.

These two views are especially useful when it's your turn to pitch. The ball can be served using the joystick in the most unusual ways. A double curve, or 'S'-shaped pitch, is possible and useful for confusing the opposition. The speed of the ball can vary too. It might start as a slow pitch, but suddenly you can make it pick up speed as it swings the batting plate.

The main screen goes wherever the action lies. If the ball is flying towards the outfield you are shown the landing zone and it's up to you to move your nearest fielder into the zone ready for the pickup. Being backyard baseball there's plenty of rubbish for the fielders to trip over. Some of the players are not so good at straight catches let alone tackling an obstacle course!

The graphics are brilliant. Special attention has been paid to colourful and realistic animation but the sound is sparse though quite intensive. You even get the occasional car horn blaring away in the background.

During a game you really get to know the players quite well, and the next time you load the game you can select different teams or try different batting or fielding positions. This is a superb game and well worth its price.

E.D.

Touchline:

Name: Street Games - Baseball. Supplier: Epyx/US Gold. Date: 2-3. Address: Way, Medford, Birmingham B14 5AE. Tel: 071-228 1268. Machine: C64. Price: £9.99 (inc. £14.99 del.). Originality: 5/10. Playability: 5/10. Graphics: 9/10. Value: 9/10.

Jackie & Wade

De Jackie has at long last perfected his transformation potion. Eager to see if it works, he takes a quick gulp and finds that he has a success on his hands. Well, not quite, as there are two slight problems. Although he has been transformed, the person that he has become, Mr. Wide, is not exactly the sort of person that you would like your granny to meet. In fact, he is thoroughly evil. The second problem? In your haste to try out your new option, you accidentally forgot to prepare an antidote.

There is only one course of action left to you. You must seek out the laboratory of your archrival Dr. Piquet, hidden somewhere beneath Hyde Park. As he was working on the same problem, he might be able to provide the antidote.

The game is a problem solving arcade adventure in the format of wandering round, and picking up various items and using them to help you get past various obstacles. As such, it is no better or no worse than the hundreds of other games of this type but is not bad value at under two pounds.

G.R.H.

Touchline:

Title: Jackie & Wade. Supplier: Eudora. 4-10 Ford Street, London EC2A 4DL. Tel: 01-27 6880. Machine: C64. Price: £3.99.

Originality: 5/10. Playability: 3/10. Graphics: 4/10. Value: 5/10.

ACE 2

As is not only the sequel to the popular ACE combat flight simulator but also includes a second player and a second plane into the action.

The action takes place just off the coast of a foreign power where one player is based on an aircraft carrier sent to monitor a radar base. The land-based player takes exception to this and although the ship is in international waters a plane is sent out to intercept. Pyrric one launches its carrier based plane to interrupt the other plane and destroy the radar station.

Before you take to the skies you can set up the game by tweaking parameters that decide the number of planes each player has, the number of hits required to blast each plane and the skill of the computer opponent if you can't find a human that can stand the game.

You can arm your aircraft with a selection of close range heat seeking missiles and longer range radar guided missiles to dogfight with your opponent and also air to ground missiles to take out the carrier of the radar base. Unfortunately you can't carry everything you need all at once so you have to decide which weapons you need first.

As with any dogfight game you are in control if you're on his tail. Cut in range and you can cut him down with a supervisor of missiles and then finish him off with cannon fire. However, he is trying the same tactics so you should be ready to take evasive action if he fires at you. This action can either involve rapidly changing your speed, direction and height, or firing a flare or chaff to confuse the missile.

The action is fast and frantic as during manoeuvres must be carried out at top speeds. ACE 2 is a worthy successor to ACE and is certainly set to become a high flier.

T.H.

Touchline:

Title: ACE 2. Supplier: Cascade Games Ltd, 3-5 Rayner Crescent, Harrogate, North Yorkshire, HG1 3BG. Tel: 01423 325215. Machine: C64. Price: £

Originality: 5/10. Playability: 5/10. Graphics: 5/10. Value: 5/10.

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Abstract

TECHNICAL STAFF

Byting into the 6510

In the fourth part of our machine code programming series, we design a typewriter routine and learn more about flags and conditional branches.

By Burghard-Heury Lehmann

In the last three articles we have worked our way up to a point where we can now fill in the whole of the Commodore screen. In the following articles I want to develop a simple word processing program. I feel that this will cover a lot of ground in terms of machine code programming, even if word processing is not your main interest; you will find that a lot of the principles we will deal with are just as relevant to you if you want to write an arcade game, an adventure game, a utility routine or whatever.

Of course, in the context of this series, it is not my intention to write a fully-fledged word processor; you can use to back out a word. All I want to develop is a simple 40 column typewriting routine and some associated editing routines.

Key Input

So far we have dealt mainly with telling the computer to output data, namely to the screen. Now, where we want to develop a word processing routine, initially we need to get the computer to input data, namely from the keyboard.

Computer keyboards are very versatile — each key on the board represents nothing more than an electronic impulse, and what result this impulse has depends on a program, resident in ROM, which interprets it. So each key on the board can do just about anything you want it to do. The *A* key on your C64, for example, can result in a capital letter *A* being printed onto the screen, as happens normally, or it can print a lower case *a*, if you switch the computer into the business mode or you could redesign the *A* key into something completely different, like function key 1, or make it start

your printer, turn a turn, or whatever you like.

All this is simply a matter of programming. As I have already mentioned, in the normal state of the C64 there is a program in the Kernal-ROM which interprets every impulse coming from the keyboard and converts it into an ASCII-code. This ASCII-code is stored in a series of locations, called the keyboard buffer.

Whenever the computer has nothing else to do, the keyboard buffer is emptied one by one and each ASCII-code is executed, that is, if it is a so-called printable character, the character is printed onto the screen, or, if it is a non-printable character, a certain action is taken, like moving the cursor, changing a colour, starting a new line, and so on.

All this is done by our good friend, the 6510 microprocessor. But since there is only one 6510 chip in each Commodore 64 computer, the question arises of 'how can all this be done without the system getting into an awful muddle about what to do first?' Furthermore, when you press a certain key you expect to get the result almost immediately! How can this be done if there is only one microprocessor which has to do this and a whole lot of other tasks besides?

Interrupts

The answer to this important question is 'interrupts'. This is a fascinating subject because it permits an 8-bit computer like the C64 which can basically only do one thing at a time, to pretend to do several things at the same time. It works because the 6510 microprocessor is able to do things at such tremendous speed. It's a bit like a magician who does tricks by sleight of hand — you can't see how he does it,

mainly because he does it incredibly quickly.

The 6510 has all the speed of the best magicians, but, of course, it has none of the brains of a Magician. Instead it does its tricks strictly to order.

Every 60th of a second it gets an interrupt command which it has to follow, except if it just has executed a machine code command which instructs it not to react to this interrupt. This is called a 'maskable interrupt', because the microprocessor can be stopped from reacting to the interrupt. There is also a 'non-maskable interrupt' which cannot be stopped at all. We will return to all this later.

If the 6510 is not programmed otherwise it executes the maskable interrupt by interrupting whatever it is doing at this moment and saving the current address in the program counter on the machine stack so that it can continue from where it left off afterwards. Basically, it is very much like being called to someone's telephone. The only difference with an interrupt is that the telephone call does not come from inside the program with a 'JBR' instruction but is hardware-generated.

Hardware-generated means that a certain action the microprocessor has to perform is not instigated by a program but an electronic impulse coming from outside the microprocessor, as from a printer or disk drive or, as a matter of fact, another chip in the computer.

The interrupt system which the 6510 executes every 60th of a second consists firstly of reading the keyboard. That is, the 6510 finds out if a key has been pressed. If a key has been pressed it goes through quite a complicated routine which interrupts

Figure 1

BEQ = Branch if result is Not Equal - if the zeroing is NOT set
BEQ = Branch if result is Equal - if the zero-flag is clear
BCI = Branch if the Carry flag is Clear (A is smaller than B)
BCE = Branch if the Carry flag is set (A is larger or equal B)
INC = INcrement contents of memory location
DEC = DEcrement contents of memory location
CMF = CoMpare with memory
CLC = CLear the Carry flag
ADC = ADd with Carry
SBC = SBorrow the Carry flag
SBC = Subtraht with Carry

that happens.

I said before that each key generates an electronic impulse. This sounds very complicated, but isn't. All it means is that if any key has been pressed, a voltage is coming from the keyboard, while if no key has been pressed, there is no voltage. This means of course that the impulse generated is exactly the same for each key. How can a then distinguish between keys?

The keyboard is mapped into a coordination system and each key is interpreted by determining from which part of this co-ordination system the impulse comes. It's a long process of elimination, and the end result of this is an ASCII-code. This ASCII-code is then pushed into the keyboard buffer (location 64H-64H).

Amazingly enough, this is not all the 6810 does every 60th of a second, if the machine is in the normal mode it also puts the cursor on the screen into another "blink-phase" so that it will appear to us slow humans as if the cursor is flashing.

Having done all this, the 6810 returns from the interrupt, recovers the address where it left off and continues with the task it was doing before as if nothing has happened. Quite amazing isn't it?

Returning now to our word processing task, there would be little sense in our writing a routine which reads the keyboard port. All we need to do is to get hold of the last ASCII-code produced by the microprocessor and then write a routine which tells the 6810 what specifically we want it to do with that ASCII-code.

For that it would be best if we could have that ASCII-code in the A-register of the 6810. For this we use a very simple ROM-routine, called "GETIN", which gets one character from the keyboard buffer and puts it into the accumulator. If there is no

character in the keyboard buffer, that is, no key has been pressed, then a zero is loaded into the accumulator. This of course sets the zero-flag.

In line 140 of our program I introduce the opposite of the "BEQ" branch instruction which we have already learnt about. "BEQ" stands for "Branch if the result is Equal", that is, if the zero-flag is set.

What we want to do here is obvious: if no key has been pressed, which results in the zero-flag being set, we loop back to the "GETIN"-routine, until a key has been pressed.

Now the zeroing will be clear because a number larger than zero will be in the accumulator. This is of course the ASCII-code we wanted. It tells us which key has been pressed. It is now up to us to do whatever we want with it.

Exit

"Exit already?" you may ask. "We haven't even started yet!"

But this is very important in machine code programming. Remember, the 6810 has no safety-net and doesn't give any error reports. If you set it on a certain course and don't tell it when to stop it will go on ad infinitum. There might be no way you can stop it, except by unplugging the machine. So always ask yourself the question: "Has this routine I am writing got an exit? This is most important in machine code programming than in almost any other language."

Most other bugs you can iron out in due time without much frustration. But if the 6810 gets itself into a routine or loop without an exit, you are well and truly lumbered. All you can do is unplug the machine and lose perhaps hours of your work!

Surprisingly enough this bug can

even arise when your routine is basically working fine. For example, our typewriter routine would work perfectly without a hitch. The problem would only arise when we want to get out of it. Because we can't escape by unplugging the machine...

The exit I have chosen for our program is function key 1. If it has been pressed the ASCII-code 123 will be in the accumulator. So in line 160 I compare whatever is in the accumulator with 123 so that, if it matches, the zeroing will be set and the 6810 will jump to the exit-code in line 1110 via the branch instruction "BEQ EXIT".

In line 440 I do another test, this time against decimal 20. If you look into page 125 of your user manual where all the ASCII-codes and how the CPU interprets them are listed, you'll find that decimal 20 is normally the value for the delete key.

Since I wanted to include a deletion routine in our program, line 440 is where the microprocessor will branch to if the appropriate key has been pressed.

Printing a Character

The routine in lines 470 to 540 outputs a printable character to the screen.

There are two sides to this routine - first we have to convert the ASCII-code into a screen code which the 6810 can put on to the screen in the usual way and secondly we have to determine the position on the screen where we want the character to be printed.

If you compare the ASCII-codes on page 123-127 in your user manual with the screen codes on page 122-124 you'll find the following main differences in the way the various characters are represented.

Codes 32 to 63 match exactly. ASCII-32 is always a space and that is the first of the printable characters in the ASCII-range. After that follow various symbols, like "0" and "9" then the numbers from 0 to 9, then some more symbols and punctuation marks. All these are the same in ASCII-codes and screen codes, which means that we can write them to the screen unchanged.

From ASCII-64 onwards the two lists diverge: The "A" in a code is ASCII-64, but screen code 64 is short. For everything that follows from 64 we have to subtract 64 in order to arrive at

the proper screen-code.

This kind of thing is unique to the Commodore range of computers. The reasoning behind it is the ability to have two separate character sets. Set 1 is meant for graphic purposes, while Set 2 is meant for word processing.

Since it is word processing we want to do, we are interested in Set 2 which gives us capital and lower case letters.

Lines 280-290 switch the C64 into the business mode or lower case mode, as it is also called. ASCII code 14, which is one of those non-printable characters I have mentioned above, is loaded into the accumulator and the ROM location at \$E71B "resets" the code, meaning in this case, switch the C64 into business mode. You get the same result if you enter the BASIC command "PRINT CHR\$(14)" or press the Commodore (and shift) key together.

"\$E71B" is a hex number. So far I have on purpose avoided dealing with hex, because, unlike other machine code programmers, I do not consider hex an absolute necessity to successful machine code programming. Nevertheless, at a later date I will introduce you to the mystery of hex too. At this moment just enter the number as it is given in the listing.)

If a key and the shift key are pressed at the same time the "GETIN" routine will return an ASCII code which consists of the normal ASCII code+128. Therefore any ASCII code larger than 128 has to be a capital letter. Anything smaller is lower case.

The Carry Flag

So we want to know first of all if a number in the accumulator is smaller or larger than 128.

This brings us to the second most widely used flag in the PS or flag register, the carry flag.

In simple terms, the carry flag is set if the result of a subtraction does not go, that is, if the result is negative and it is clear if the subtraction goes, that is, the result is positive. Since subtracting two numbers from each other is the arithmetical way of comparing them with each other, the carry flag serves the extremely important purpose of telling us when one number is larger or smaller than another.

If A is smaller than B, carry will be clear. If A is larger than B, carry will be

set. Furthermore, if A equals B, carry will be set too.

Where there is a flag there have to be conditional branch instructions testing that flag. By now it will have become clear to you that this is the way we program the 6502 to make decisions. We arrange a certain operation which has an effect upon the flag we are interested in, then we test that flag with the appropriate branch instruction and this makes the 6502 jump to the appropriate location.

The carry flag is tested and acted upon by two branch-instructions which are "BCI" and "BCS". "BCI" ("Branch if the Carry flag is Clear") asks if the carry flag is clear. If yes, the 6502 branches, if no it doesn't. And "BCS" ("Branch if the Carry flag is Set") asks if the carry flag is set.

Or, as put it differently, "BCI" branches if the number we are testing is smaller than the one we are testing it against. And "BCS" branches if that first number is bigger than or as big as the second one.

In our routine we want to know if the carry flag is clear after it has compared the ASCII code in the accumulator with the value 128 after the "CMP" instruction.

If carry is clear, it will mean that we have a lower case letter, and, as you will discuss shortly, in this case it suits us to jump forward.

If carry is not, we've got a capital letter on our hands and want to subtract 64 from it. Then we go into a second test, and if the remainder is larger than 64, then we again subtract 64. The result will be a number larger than 64, and if you look that up in the manual, you will find that in Set 2 that indeed gives us a capital letter.

In a minute it will become clear to you why I subtract 64 twice and not 128 once. First let us look at the subtraction operation itself.

Subtraction

As long as you operate within the 8-bit range of numbers, subtraction (and addition) is quite straightforward on the 6502. You simply put the number you want to subtract from into the accumulator and then give the number you want to subtract together with the "SBC" instruction, which stands for "Subtract with Carry". The result of your subtraction will then be put into the accumulator. But why subtract "with carry"?

With each subtraction the state of the carry flag is taken into account. Because of this it is prudent programming to use an additional instruction every time we subtract.

"SEC" stands for "Set the Carry flag", and this is one of the few instructions of the 6502 which are used to program the flag register directly. If we didn't do this and the carry flag was clear, the subtraction would be incorrect by one.

So always remember - before you subtract, ensure that the carry flag is set by using the "SEC" instruction!

Addition

Addition is done in the same way, but now you have to ensure that the carry flag is clear. To do this, use "CLC", which stands for "Clear the Carry flag".

Unlike other micro processors the 6502 has no addition or subtraction instructions which do not take the carry flag into account. So, play safe and always set the carry flag properly before you add or subtract!

Both the add and the subtract instructions can be given in all the addressing modes. That is, you can give the number you want to add or subtract immediately or you can tell the 6502 the location, where the number is, in all the various addressing modes which we have described in the last three articles.

In our routine we do it immediately of course because we are dealing with fixed values.

At this point I have to admit that the use of "SEC" in lines 310 and 330 is not necessary in our routine.

Can you guess how this exception to the rule I gave you above comes about?

Well, each time, before we subtract, we test if carry is clear. And if carry is clear it jumps over the subtraction routine. Therefore, when it does the subtraction carry has to be set! So when typing the program in you can omit lines 310 and 330. But remember, in most other situations you can't be that sure and have to use either "SEC" or "CLC".

In line 330 I compare the remaining ASCII code again with 64. This is to test if it's a character in the range 128 to 160 or a letter in the range 64 and upwards.

If it is a letter then I have to

subtract 64 again, and now it will become clear to you why I subtract 64 twice in the case of a capital letter: In this way I have a nice hint to this routine, otherwise I would have to make it jump over the second subtraction which costs extra bytes for a jump-instruction.

Having at last arrived at the proper screen code we can now print the character onto the screen.

Print Position

We print the character onto the screen in exactly the same way as we have described in the last article by using indirect-Y.

There is only one major difference: Because of the nature of the program we are writing it doesn't suit so simply to increment the index to arrive at the next position. Instead we prefer to have the exact current position always in "SCREENMEM" and "SCREENCOL". This is useful for when we want to design all sorts of additional input routines, like cursor-left, cursor-right, cursor-up, cursor-down and so on. Using indirect-Y would make it too complicated.

But because of this we have to ensure that Y contains 0 whenever we output a character. This is done in line 580, and you might think that this is not really necessary since we haven't used the Y register anywhere else.

But remember the "GETIN" routine at the beginning! Most ROM routines use all of the registers and thus corrupt them. So we can't take it for granted that Y will still contain 0 after it has returned from the "GETIN" routine.

This is another important point: Always be aware that ROM routines (as well as subroutines written by yourself) use and corrupt registers. So if you need a certain variable, you might have to save it before calling on the ROM routine and restore it afterwards! Of course, in our case we don't have to save Y since we know that it always has to be zero when we print it.

Counting Upwards

The overall gist of our print routine is that we want to print a character to a certain position and then update our pointer-locations. ("SCREENMEM" and "SCREENCOL") so they point at

the next print-position. Since we write in our culture from left to write the next print position is one more than the former one. In other words, we count upwards.

Again because of the limitations of the 6502 this is not as straightforward as it should be. Sure, as long as we are within the 16-bit range there is no problem. We just increment the location of register by one. But the moment we arrive at 255 it will of course overflow, which means that the location of register reaches back to zero.

This is where the high-byte of the number we are dealing with comes in. Every time we reach 255 (or 63, the high-byte has to be incremented by one).

This is not done automatically by the micro processor. It has to be programmed!

So, in line 670 we increment the high-byte of "SCREENMEM". Then we test the zero-flag. As long as the result of the former operation is between 1 and 255, the zero-flag will be clear. Therefore BNE branches us over the following instruction which increments the high-byte of "SCREENMEM".

Only when we reach the crucial 256 (or 64) point will the zero-flag be set. Now it won't branch and the high-byte of "SCREENMEM" will be incremented (line 690).

Lines 710 to 730 do the same thing with "SCREENCOL", and then our routine is finished. We jump back to the "GETIN" routine (lines 120 to 140) respectively, depending upon the high-byte having to be incremented or not in order to await the next keypress and repeat the whole process.

Deletion

The deletion routine which follows is in a way more straightforward than the print routine. All we want to do is to decrement our print position by one and print a space over the character which we want to delete. (In a later article I will give you a more sophisticated deletion routine which is similar to the one used when you press the delete key normally. But for the time being this one will suffice.)

To start the routine it is prudent to build in a safety catch. After all, we don't want it to be able to go backwards ad infinitum and write

spaces into all sorts of locations. So we want to prevent the deletion routine from going over the beginning of the screen.

In line 820 to 870 I tested the current screen-position against the beginning of the screen, which is 1024. If the two values are equal, the routine jumps straight back to "GETIN", that is, no deletion-action is taken.

Because I compare two 16-bit numbers with each other I have to do the comparison in two parts. First I compare the two low-bytes. If they don't compare I will know already that it isn't at the beginning of the screen. In line 840 the zero-flag will be clear and it will jump straight to the beginning of the deletion routine.

If, on the other hand, the two low-bytes are equal this is still not conclusive evidence that I am at the beginning of the screen. So I now have to test the two high-bytes. If they too are equal, then I know for sure that it is at the beginning of the screen.

Counting Downwards

Now we want to decrement the screen position by one so that we can print the space and thus erase the former letter.

Counting downwards on the 6502 is even more involved than upwards, if we are dealing with a 16-bit number.

First I load the low-byte into the accumulator in order to test the zero-flag. If the zero-flag is clear, that is, if the low-byte is between 1 and 255, then I need only to decrement the low-byte.

But if the zero-flag is clear, that is, the low-byte contains 0, then I have to decrement the high-byte as well as the low-byte.

Finally

The rest of the deletion routine and the main end of our program in line 1110 should be clear.

Listing 1 gives you the whole of the program I have described in this article and in figure 1 I give you a list of the instructions we have dealt with in this article and in the last one.

When you try the whole program on you will find that rather irritatingly something is missing: There is no cursor!

Next time I will explain how we can add a cursor to our routine, and an interrupt driven cursor at that. So sit it there, watch this space - it'll be good.

California Games

If you want sunshine and fun, then look no further than the latest release from Epyx.

By Eric Doyle

In the wake of Summer, Winter and World Games come the Epyx thrills and spills of the sunshine state.

Just when I thought that the Epyx Games series had run its course, US Gold pull a stunt like this on me! For my money California games is the best yet, and that's really saying something. The graphics are radical, the gameplay is varied and the sound...well it's better than the previous game!

Up to eight players can share the experience of the six competitions and each competitor can have a sponsor. Yes folks, Sponsorship has arrived and, when the finished version appears, US Gold hope to have a set of British sponsors.

First of all, dust off your skateboard for the Half Pipe event. As the name suggests this event takes place on the inner surface of an enormous tube cut in half. There are three basic turns you can make to score points: the basic Kick Turn, overhead Hand Plant and super flashy Aerial Turn. The trick is in your timing and speed - go too fast or hold a turn too long and you'll wipe out.



You have just a minute and a quarter to start the judges with your talent, but fall three times and you'll hang up your skateboard early.

After all this action at earth tremor prone Beverly Hills, we now head for the beach because it's 'Foot Bag' time. Foot Bag? Yes it's the latest craze for macho types. Keep a little bugga ball in the air without the aid of your hands and perform as many tricks as you can for another minute and a quarter.

Surely there can't be that many kicks you can perform? Well there are eleven ways to score and each combination of moves results in a name such as Dirty Dream, Jester or Aole Foley. Each combination scores a different mark, the most difficult being the Dude. To complete this move you have to bounce the ball with an outside kick onto your head and then kick the ball back with an outside kick from your other foot!

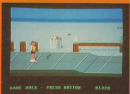
Even California has saguillo and there is one that keeps flying across the score. If you can hit it with your ball you can score extra points as the bird spots parson's nose over back with threats of revenge.

After heading your feet on the beach you go on to ride the rollers of the Pacific. "Surfing" is a passion for Californians and catching a wave is almost a religion. The massive rollers curl as they break forming a tube and it's the aim of every surfer to ride inside the tube. High scores can be achieved for this trick and you can also perform heaps, which are the just hitting your "weedy" (weirder) swells (the crest of the wave) or perform during "MOT" (motes).



At the end of each run a group of beach birds offer their opinion of your run and a score is averaged out from this.

"Roller Skating" on the promenade of Calicut beach is hazardous because of all the junk scattered around. In this simulation you have to leap over all of the obstacles there are in your path. If you have the foresight and grace to execute a tasteful spin as you jump, your point score is boosted. Beach balls, cracks, uneven surfaces and junk food containers have all to be negotiated before you complete the course.



Did you know that "BMX" stands for Bicycle Messengers? In this game it also stands for Blue Murder and exasperation! It seems the liver louts have been at it again and the course is strewn with logs, trees and oil drums. The path unravels into series of whoop-a-dies and you can wheeler your way along the straightaways and perform superb feats from the turn of the hottest wheel.

As you jump you can grade in one of several ways for lots of lovely bonus points. The most difficult stunt to perform is the forward somersault which can bring a maximum of 6800 points. Compare this with our high score and draw your own conclusions.



By this time a more sedate game would be welcome and what have we got? Friskin is to be more up-to-date, the "Flying Disk". All you have to do is to throw it as far as you can and catch it before it touches down. Not as easy as it sounds. First the thrower has to gauge the strength and angle of the shot. Then the catcher has to get into position and catch the disk as it comes.



These are the games and I've spent hours trying to beat my own high scores. To give you something to aim for here are my scores so far:

Half Pipe	2079	Rodier Skating	26.00
Foot Bag	17500	BMX	54.00
Surfing	3.2	Flying Stick	1.500

If I had to lose all but one of my Eggs Game discs, I would choose to keep this one.

100

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Bothersome Basic

Continuing our Basic series, the highly strung personality of the Commodore is revealed

By Eric Doyle

One thing that never ceases to amaze me about computers is the way they appear to have intelligence. The more you get involved with programming the more you realize what an illusory phenomenon this is. The simplest way of building 'intelligence' into your programmes is by making the computer appear to respond on a personal level.

```
10 INPUT "CLR,DOWN,DOWN)
HELLO, WHAT'S YOUR FULL
NAME";NAME$
20 IF NAME$="" THEN G0
30 PRINT "OH, IT'S YOU";NAME$;
I'VE HEARD A LOT ABOUT
YOU"
```

When you type in this program, remember that the characters in the square brackets are not entered as you see them here. After opening the quotation marks, ignore the square brackets completely and hold down the SHIFT key and press CLR/HOME. This will give a reversed out heart shape.

Next, you press the cursor down key to give a reversed out letter Q and then press again for a second Q. When the program runs, this will cause the computer to clear the screen and move down two lines before printing out the question. For more information on

these symbols, refer to the *Living's* page in this month's issue.

I have used the word INPUT instead of PRINT at the beginning of the line and so when the program is RUN the computer will know that something will be entered later via the keyboard. After the question, the semi-colon prevents the computer from jumping down to the next line. In response to the INPUT command and the semi-colon the computer will finish off your question with a question mark and the cursor will reappear and flash at the end of the line.

The program is still running at this point but the computer is waiting for a response from the user. We want the computer to 'remember' what is typed in, so we have to tell it to store the answer somewhere. We have seen that the computer stores information as a variable but so far these have only been numbers. This time the variable will be a series of letters.

Variable Questions

For storing such an input, the computer has a special kind of variable known as a string which is indicated by a variable name (NAME) and this is labelled as a letter store by adding a dollar sign (\$) after it.

Number variables, or the correct term, numeric variables, can be directly assigned in a program (A=123) and strings can also be directly assigned: NAME\$="ERIC". Notice that the string of characters is placed inside quotation marks. When a string is INPUT from the keyboard the computer assumes that the response has quotation marks around it, so you don't have to bother to put them in.

After RETURN is pressed the computer checks to see whether something was entered by executing line 20. The IF/THEN command is fairly self-explanatory. If the contents of NAME\$ has nothing between the quotes THEN the program will loop back to run line 10.

If something has been typed in, the program then executes the final line. This is simply a PRINT statement modified to insert the name in the middle. Once again semi-colons are used to force the computer to keep printing on the same line. To see the effect, erase everything after the first semi-colon and enter two new lines:

```
40 PRINT NAME$;
50 PRINT " I'VE HEARD A LOT
ABOUT YOU"
```

After running this to see that the result is the same as before, try erasing the semicolons to see what effect they had.

Once you have created a string there are special commands which enable you to manipulate it in various ways:

```
10 A$="YOUR COMMODORE"
20 B$=LEFT$(A$,3)
30 C$=RIGHT$(A$,1)
40 D$=MID$(A$,4,3)
50 E$=D$+D$+C$
60 F$=D$+C$+D$
70 PRINT
```

After line 10 sets up A\$, line 20 saves the three leftmost characters in a new string, B\$. Similarly, C\$ becomes the single letter to the extreme right of A\$.

Line 40 takes a little more understanding. It tells the computer to save an internal string from A\$ which starts at the fourth letter and takes eight characters in all. D\$ therefore consists of the row of letters from the B of 'Your' up to and including the B of 'Your'.

Line 50 shows how strings can be added. This is not like adding numbers together, because one string is absorbed into the end of another. It's rather like saying that 2+3+6 = 256! Strings can only be added, using any other mathematical operator other than plus will produce a TYPE MISMATCH ERROR message.

We can use string manipulations in our original program. Add this:

```
21 A=128-0
22 FOR C=1 TO LEN(NAMES)
23 IF MID$(NAMES,C,1)=CHR$(0) THEN PART$(A)=MID$(NAME$,B+1,C-1-B)+C-A+A+1
24 NEXT C
25 PART$(A)=RIGHT$(NAMES,LEN(NAMES)-B)
26 "FOOL IT'S YOU "PART$(C)
27 "YOU HEARD A LOT ABOUT YOU?"
```

Forget line 21 for the moment and concentrate on 22. We're trying to split a full name into forename, middle name(s) and surname. When we write our names we denote the end of one word and the beginning of another by leaving a space between them. If we search along NAMES for a space we

know that all the characters before the space form a part of the full name.

How Long is it?

Several people may use this program, so we don't know how long each name will be. Fortunately BASIC includes a way of calculating this. The keyword LEN will return the length of any string mentioned in brackets after it. We use this in line 22 to determine the parameters in a FOR/NEXT loop which will repeat as many times as there are characters in NAMES.

In line 23 we use MID\$ to test each character in turn to see if it's a space. Instead of specifying which character the MID\$ starts with, we let the loop do this by using the current value of C. And because only one character is examined at a time we get the expression MID\$(NAME\$,C,1). If this doesn't equal a space which has a character value of 32, i.e. CHR\$(32), the program ignores line 23 and jumps to line 24. If it is a space THEN several things happen.

First of all a new string is formed. You'll notice that PART\$ is followed by 1A1. As the value of A changes we get a series of new strings: PART\$(1), PART\$(2) etc. What is known as an array. Each string, called an element, in the array has the same string name but the value in brackets denotes that each string is in fact different from all the others. The number in brackets can only range from zero to nine unless we tell the computer otherwise.

When the first space is met, A has the value of 1 as specified in line 21 so PART\$(1) takes the result of the MID\$ expression calculated on the other side of the equals sign. Let's study how this formula is derived.

A space has been found at character number C of the name. This part of the name stretches from the beginning of NAMES to the character before the space which means the last letter's position is the space's position minus one, that is C-1. For the forename this would mean PART\$(1)=MID\$(NAME\$,1,C-1) so where does the B come in?

Let's see what happens with the second name. Again the last character will be the one before the next position (C-1) but the name starts somewhere in the middle of NAMES. The actual position is the last space position plus one. If we calculate this when we separate off the first name with the

expression B=C we can use B+1 as the start of the second name. This makes MID\$(NAME\$,B+1,C-1) but C-1 gives the total number of characters from the beginning of NAMES to the character before the second space. That's too many, as we only want the number of characters from the last value of C to the current value of C.

Luckily, we have stored the last value of C when we said B=C so if we subtract B from the current value of C we get the length of the second name. This includes the space at the end of the second name, so we still have to subtract one, hence we get MID\$(NAME\$,B+1,C-1-B).

What value do we give B to start with? Remember I said earlier that the first name could be given by the expression MID\$(NAME\$,1,C-1). If we substitute a zero for B in MID\$(NAME\$,B+1,C-1-B) we get MID\$(NAME\$,0+1,C-1-0) which simplifies to MID\$(NAME\$,1,C-1). Perfect! We have the magic formula which covers all cases if B is given an initial value of zero (as specified in line 21).

What happens when we reach the end of the name? Since there is no space at the end the 'IF MID\$ is a space' condition is not fulfilled so a string is set up for the surname. To overcome this we have line 25:

```
25 PART$(A)=RIGHT$(NAME$,LEN(NAMES)-B)
```

All we have done here is to chop-off the end of NAMES from the last value of C which was stored as variable B. This is subtracted from the full length of NAMES to give the length of the surname: LEN(NAMES)-B. As the surname goes to the end of the string we can isolate it by taking the RIGHT\$ to the length of the surname: RIGHT\$(NAME\$,LEN(NAMES)-B).

Finally, I've modified the last line to address the user by first Exname only: PART\$(1).

We can now use what we've found to make the computer appear even more human:

```
40 IF A > 1 THEN "YOU HAVE "PART$(1) TO YOUR NAME "PART$(2)"
50 "GIVE MY REGARDS TO THE REST OF THE "PART$(3) FAMILY WHEN YOU NEXT SEE THEM."
```

This is not a perfect program, so play around with it this month and we'll see how to error trap in a subsequent issue of *Your Commodore*.

A Valuable Utility

Before we jump into the Deep End I have two more things to say. First of all, if you type LIST, line programming comes up the screen at a ridiculous speed. Pressing CTRL, as it has done help a little, but the fast way to get a slow listing is to use this little tip. Type in POKÉ 56325,1. This does have the side-effect of making the cursor a bit hyperactive but you should be able to type in LIST.

The list will proceed at a very low rate of lines and when you want to examine a line you can hold down CTRL and the listing will pause for a long time. To reset 56325 press RUN/STOP and RESTORE. Why spend a fortune on a utility cartridge when it's so easy to clean list?

Finally, I'd like to remind you that any problems which arise out of this

series or any general queries about *Commodore Basic* should be addressed to *Bottomsline Basic*, Your Commodore, 1 Golden Square, London W1R 3AB. If you want a personal reply please enclose a stamped, self-addressed envelope.

In at the Deep End

When you have a lot of screen displays in a program, typing in all those cursor down and cursor right symbols gets boring and confusing. The PRINT AT command is the only thing I carry about Sinclair Basic. You can get a similar effect on the C64. First set up two strings:

```
10 FOR A=1 TO 99: L=18: R=18: NEXT
(RIGHT) NEXT
20 DS="THOMAS" FOR A=1 TO 40
S="DOWN" NEXT
```

If you want to see what these strings look like, run the program and

type either POKÉ 512, LTR or POKÉ 512, RTD.

Now we can set up a subroutine to pick out the bits of these strings that we need:

```
1000 LEFT$(DS,YLEFT$(L),X-1)
1010 RETURN
```

Now your test can be printed at a specific position by stipulating how many columns across (X) and how many rows down (Y) we want the first letter to appear:

```
30 X=18: Y=10: GOSUB 1000
40 PRINT
50 X=25: Y=21: GOSUB 1000
60 PRINT HOMER
70 END
```

This routine does not appear to be any slower than the usual symbol method, and is not prone to overflow using fewer bytes of memory in most programmes.

More Deep End hints and insights in the near future. Get those letters rolling fast!

10

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Amiga News

Expand your RAM

A two megabyte RAM expansion box is now available for the Amiga PC1800 from Rambit. The unit, which costs £65.00, is compatible with all Amigas and plugs into the bus expansion connector. For PC5000 users, a special interface is available for £19.95.

Books and Software Galore

Users of Commodore's A500 and A2000 can now read all about it in four recent publications from Abacus.

Amiga Basic - Inside and Out will tell you all you need to know about programming the Amiga in Basic. Approx. retail price: £16.95.

Amiga Tricks and Tips will enable you to program a wide range of the Amiga's features such as accessing Intuition and making use of the advanced graphics programming using windows and macros. Approx. retail price: £12.95.

Amiga for Beginners will give the first time user an introduction to the Amiga and will cover the necessary housekeeping chores and the first steps in Basic programming. Price to be announced.

Amiga Machine Language is the guide for those who program in fast machine language and need to get to grips with the 68000 processor, address modes and instruction set. Price to be announced.



When you've had enough reading, consider the new range of productivity software packages from Abacus.

TextPro is an intermediate level wordprocessor which has been designed with fast entry in mind. The package features fast on-screen formatting, automatic hyphenation, the capability to include graphics with text, 48 user-definable function keys and flexible printer driver installation. Price to be announced.

BeckerText is a professional quality wordprocessor which features the additional functions of WYSIWYG formatting, multiple

column printing, realtime online dictionary for type along spell checking and automatic index generation. Price to be announced.

Data Redress is a data management package which features pull-down menus which enable the user to quickly define files and enter information using normalised and flexible screen templates. Price to be announced.

AccumPro is a language development package which contains all the tools for writing programmes in fast machine code. Price to be announced.

Games Update

English Software have come up with a game that could be the hottest snooker player with *Q Ball*, imagine playing a pool game inside a cube, firing up shots in three dimensions and being able to rotate the table in 3D while you make your shot. If you feel you're up to the challenge that Harcourt Higgins might even stay

clear of, this game is for you!

Rainbird's Level 9 programming team have come up with a three-part fast packed adventure in *Amiga Doc*. You play the role of an oppressed one in a magical world of illusion and deception where you will communicate with other characters, learn spells and solve puzzles.



English Software's *Q Ball*



Lord F Celebrating Knight On

Turn On On

A useful utility for Amiga users is an ON/OFF switch for the A500, which allows the power supply unit to be placed well away from the computer, allowing freedom of movement around your computer. The existing power inlet is simply plugged into the A500 switch and then the whole unit is plugged into the power socket - what could be easier? Price at £14.75, the switch is available from Lifetime Products, 22 Winston Avenue, Stockbridge, Sheffield S10 3LA.

Forms in Flight

The Amiga Centre in Scotland continues its policy of importing some of the most interesting graphics software for the Amiga from the USA. The latest addition to the catalogue is *Forms in Flight*: a 3D drawing and animation utility. Objects can be drawn in both two and three dimensions and can then be viewed from any perspective or direction. The objects can be moved or rotated about any point to create animated effects such as pan, roll, magnify, multiple light sources and hidden line removal all possible. But watch out, you will need 100Ks of RAM minimum to work this magic.

The £50 inclusive price tag is reflected in a large spiral bound

manual and a highly professional presentation. The software is menu driven. Playback supports low resolution with 32 colours and medium and high resolution with 16 colours. Plotters understanding the standard Hewlett Packard drivers can plot the objects, which are maintained in libraries, on paper. Details on 031 357 4242.



Forms in Flight

Games Galore

The Amiga is looking more and more like the natural successor to the C64 with a flood of new games available. MicroProse have promised us *Blades*, a fantasy role playing adventure and Amco's 'budget' 4in Amiga boxed range of 10-15 games is the first indication of more reasonably priced software.

Advertising Available

Commodore are promising the computer trade an Amiga 'advertising available' this Christmas. Advertising in the trade press has spelled out the advantages of the Amiga 500 over any rival home computer so there should be no shortage of shops to buy an Amiga from over the holiday period.

How do I get it?

It's alright, in giving you an exotic address and ZIP code for some Los Angeles neighbourhood but how do you get the software? Well, you can either:

1. Check the ads - English Commodore dealers are importing more and more software all the time.
2. Try our contact addresses/telephone numbers.
3. Get in touch with Commodore UK who can supply you with a brochure full of goodies for your Amiga.

Alsons, 2301 Salamander S.E., P.O. Box 1219, Grand Rapids, MI 49503. Tel: (616) 241 2500.

AR Computers, 173 Thornbury Road, Garsley, Islworth, Middlesex, TW7 4JN. Tel: 01-498 7348.

Addison Wesley, Finchampstead Road, Wokingham, Berkshire, RG11 2JZ.

Amig Development, Tel: 213-982 9072. Amiga Centre Scotland, 4 Hart Street Lane, Edinburgh, EH1 3NN. Tel: 031 557 4342.

Applied Vision, 25 Oak Ridge Road, Medford, MA 02155. Tel: 617-438 3632.

Artisan Software, 275 Kennel Road, London, W10 3DB. Tel: 01-880 0320. Artimes, Tinsdale Cottage, High Cottages, Wakeham, Poolehorne, BH43 6AZ. Tel: 0934-607 583.

Cavendish Commodore Centre/UK Amiga Users Group, 65 London Road, Lutterworth, LE17 0QJ. Tel: 0533 259895. Club Amiga, 85 Upper Drumcondra Road, Dublin 9, Ireland.

Commodore (UK), Commodore House, The Switchback, Gardner Road, Maidenhead, Berks, SL6 7SA. Tel: 0628 750088.

Computall Ltd, 75/79 Chadderton Way, Oldham, OL4 6DH. Tel: 061 652 8006.

Diamond Software, 56 Knighthill, London SW27 0JD. Tel: 081 761 7965.

Edwards, Hall Farm, Stokenham, Essex, RM34 3QH. Tel: 0708 856468.

English Software, 1 North Parade, Parslopp Gardens, Manchester, M13 2NH. Tel: 061-835 6358.

Felkin Software, 3175 South Hoover Street, # 275, Los Angeles, CA 90007.

George Thompson Services Ltd, Whinnygate House, Old Regent Road, Rushworth, Surrey RH13 7DR. Tel: 031 784 4873.

Gold Disk, 80 Box 789, Somerville, Massachusetts, Ontario L3M 2C2. Tel: 416 828 0963.

HB Marketing Ltd, Pier Road, North Fylham Trading Estate, Fylham, Middlesex TW14 0TT. Tel: 01 844 1303.

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WordPerfect

We take a close look at what could be the ultimate word processing package for the Amiga.

By Anne Owen



WordPerfect Family

Sentinel are lucky, selling WordPerfect, and the associated family of software products in the UK is 'hot' for them. Everyone in the company uses them and looks forward to the next package from across the Atlantic. The latest Amiga version of WordPerfect arrived to great excitement while I was visiting. If the Amiga family (especially the 2000) does well, then we Amiga users can also look forward to more software from the Unix based WordPerfect programmers. Current products include a spreadsheet and database.

WordPerfect Amiga takes its place beside Atari ST, Apple Macintosh and IBM versions in the PC field. The Amiga 2000 can, in particular, take advantage of the text file compatibility between different computer types. At the recent Commodore show, Sentinel had both Amiga and IBM versions running side by side in the 2000, one in the Amiga, one in the MSDOS task window. When you buy WordPerfect on the Amiga, you buy a product which is available on almost everything, including DEC VAX and PC networks.

Working with WordPerfect

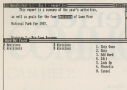
WordPerfect has got every 'standard' feature you would expect of a wordprocessor. Each feature is accessed via push-down menus and submenus - all with alternative (function) key presses - with a 3 choices offered on screen. For instance, on selecting a search and replace on formatting codes, all the codes are listed on screen for you to choose. You are not expected to remember them or look them up. Substantial help texts can also be called up to explain any operation.

No requirement therefore to start with the manual whereas the more advanced features can be learned by using the tutorial disk and the manual together. WordPerfect, unlike some packages, is fully in tune with the Amiga environment. Just click on the disk icon, then the WP icon and you are into the full-screen text window, which can be

The persuasive professionals from Sentinel Software recently took me through an extensive demonstration of WordPerfect, a wordprocessor whose functionality no other Amiga software package can match so far. The finished product should be available from your local dealer by the time you read this.

I had heard about WordPerfect on the IBM PC, the best selling wordprocessor - 13% of the UK market. I heard that Sentinel has target sales of three million pounds this year (you will have no trouble getting a £ sign on this wordprocessor - see below). I heard that WordPerfect was becoming a standard, number one in the charts, used in more by Marks and Spencers' no less.

I also heard that on the PC WordPerfect 4.2 costs £425 but that Sentinel copies twice the staff supporting WordPerfect more than selling it to the non-WordPerfect user. The Amiga version is WordPerfect 4.1 and costs £295. I also heard that there is an educational price of £75 for training (£135 for administration departments).



stored and scrolled like any other. A number of document windows can be open at the same time. The function keys are surrounded by a printed template with colour coding for the different key press combinations, e.g. SHIFT and function key. In this way a key can, say, activate a word count or go to a page number.

The programmers have cut down disk access to a minimum, meaning fast retrieval of file information. This is displayed in a window with ten options listed alongside. Files can be marked for selective operations such as delete, copy or printing (which is in the background from this window - in other words you can continue wordprocessing). 'Info' files are available but can be suppressed from the WordPerfect display. Files are sorted alphabetically and can be searched for a word match. They can also be protected by password. An 'ASCII' check provides a quick way of displaying the contents of a file.

The editors option adds the selected file to document as standard text or can be merged. Each document is held in 'virtual memory' which means that the text can be as large as disk storage will allow with text loaded into memory as required without intervention by the user. WordPerfect periodically makes a backup of your file in case of accident but documents also have to be saved at the end of a session.

Editing Text

Before describing some of WordPerfect's editing abilities, it is necessary to explain that each document has two elements. For each text that is visible on screen, there is a second text 'below' with formatting codes included. This second text can be displayed in the bottom part of a split window and can be edited in the same way as the 'top layer'. The codes look like this:

(Margin, Set0,74)
(C)
(HR)
(Tab Set 1,15)
(TAB)

and affect the text after them until the next equivalent command takes precedence. As required, the user can go to know them and take precise control of the text at low level. For the great majority of the time these codes will be inserted invisibly as you edit a document, choosing line spacing,

centering, justification, hyphenation and so on. All style and formatting features can be generated with the mouse or from the keyboard. Differing line lengths, simply adjusted on the ruler, tabulation and bold and italic styles are shown on screen.

Modifications to the text can be made by character, word, paragraph or marked block. Rectangular blocks can be copied, deleted or moved out and pasted style. As well as editing text over a single line length, you can type into columns across the page. The columns can be protected or 'newspaper style', where the text flows from the current column into the next column to the right of it.

Advanced Facilities

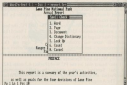
WordPerfect is plainly for the Amiga user who processes large amounts of text. For the product catalogue, information booklet or book, an automatic coding facility is available. Once activated, each paragraph is assigned a new number. Each new tab position gives a new level (and style) of numbering. There is a large range of styles to choose from, for instance IV, I, A, a.

Each page of WordPerfect document can have its footers and headers and a footnote generated as you write will automatically appear (with correct formatting) at the bottom of the page. A table of contents and an index, both with headings and subheadings and a variety of presentation styles, can be automatically generated by marking the required words.

For anyone who wants to incorporate straightforward maths into a document a type of mini spreadsheet is available within WordPerfect. Figures, formulas and descriptive text are entered into up to 26 tabulated columns. Subtotals and totals are displayed and any changes recalculated.

The mail merge facility is always a vital part of any wordprocessor. At its simplest level WordPerfect will merge a standard document with a list of alternative texts typed into WordPerfect itself. WordPerfect uses a set of special merge codes which are prefixed with '^' (CTRL). '^R' indicates a record end in a merge list for instance, '^Q' halts the merging process and '^C' takes text direct from the keyboard. Text can be merged from a primary and secondary file with the results going to the printer or a disk file.

Movers repeat off-used keystrokes and WordPerfect will



meant a set of keypresses like a digital tape recorder ready for replaying at any time, for instance from within a merge file. You must call the macro by the name you choose for the definition.

Spell checking has become a standard feature of modern wordprocessing. WordPerfect can check by document, page or marked block. If an error is detected then likely replacement spellings are offered for a quick click of the mouse. The checker can also pick up double words and numbers in words if required. A supplemental dictionary can be created from words unrecognised by the main dictionary and there's a program module to add it to the main dictionary if required. Foreign language options are available. The thesaurus complements the dictionary with a vocabulary broken down into verbs, nouns, adjectives and adverbs (opposites). You can quickly move around alternative possibilities by clicking on them with the mouse.

Output

Printer features such as font, pitch, lines per inch paper and underlines, though not displayed, can be specified by codes in the text. The 256 printer drivers, as well as making Preferences look stupid, mean that, whether you use dot matrix, daisywheel or laser, there is in all probability a simple set-up procedure for you. You can also build your own printer driver and assign any character number to any

printer code. For instance you can assign the Amiga internal character code 163 (the £ sign) to the code which generates that character on your printer.

Sophistication

For me the sophistication of WordPerfect is reflected in this sort of attention to detail: when you mark a block of upper case text and turn it into lower case, WordPerfect will, by default though not necessarily, retain upper case characters at the start of any sentence within the block, Marvellous! And if you get anything wrong there are three levels of 'undo'.

There are more of the desk top or form drawing features of some specialist wordprocessors, but WordPerfect appears to provide sophisticated and well-directed facilities without leaving the user behind. My brief acquaintance left me impressed and pleased that the Amiga's potential is beginning to be fulfilled by ambitious software, the power of which I have only been able to hint at in this article.

Availability

WordPerfect Amiga in version 4.1. It comes on four floppy disks with manual and keyboard templates. Price is £299. The Amiga Users Group is offering a £50 trade-in discount for Scribble users who wish to upgrade to WordPerfect.

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Amiga Games

Another batch of games for the Amiga, old favourites and hot new properties jostle for places inside Your Amiga.

Cruncher Factory

Do you remember Pac Man? That seemingly rare game where you controlled the movements of a yellow, ball-shaped mouth that ate and ate and ate...?

After *Angeroids*, Pac Man was probably one of the first arcade games to make it big Stateside; it is probably the only arcade with a children's cartoon series in its name (thank God), and after setting off a whole genre of theme-orientated spin-offs, Pac Man sank into obscurity, occasionally popping up here and there in trendy motorway cafés.

Well, this time Pac Man has surfaced on the Amiga, called *Cruncher Factory*, this is not only Pac Man with all the bells and whistles, but it is the first Pac Man I have ever seen with the option to have two players playing at the same time!

The cruncher moves about the screen, eating the little dots and the larger green dots, which work as power pills, enabling you to eat the mazes for a short period of time. Sometimes a fruit appears and can be eaten for bonus points (unless the monsters get it first).

However, *Cruncher Factory* has a great deal more than its name might suggest. Because the Amiga has huge memory, Amco have added features such as Random walls appearing in the middle of the game (often leaving you in at the last minute), 30 different and increasingly wicked mazes, and the option to design another 30 of your own!

These days, maze designers are becoming increasingly popular in games of this genre, and in the case of *Cruncher Factory*, it stops it becoming just another version of Pac Man. Now you can create mazes made up of your own mazes, or you can draw shapes, or you can even have an empty screen full of dots, with just the monsters to get in the way!

This maze designer uses the screens above level 30 for your own designs and while designing them can be a time-consuming task, it is well worth the effort, as creating 30 original and interesting screens to play, or to get your friends against, while the two-player mode, gives great satisfaction (especially if they can't finish the screen) as well as keeping the game from getting boring.

Other features include the ability to knock down the walls with that appear during the game, as well as being able to eat the monsters (no Atari symbols (you can then add a little music as you're by, turning yourself into an Atari 'bouncing' ball... now is your personal).



It's not that *Cruncher Factory* isn't an enjoyable game, it's just that without these little extras, *Cruncher Factory* would be just another Pac Man rip off, good for perhaps a few games, thankfully, *Cruncher Factory* is insanely addictive and I can't stop booting the disk up whenever I have a free moment to spare.

If you are looking for Pac Man on the Amiga, then this is a reasonable game; it doesn't make the most of the Amiga's graphics capabilities, but more the less, it is enjoyable.

C.G.

Fruchtler:

Name: *Cruncher Factory*, Supplier: Amco, 10 West Hill, Buryford, Ayr S41 2BJ, Tel: 0321 9251016, Machine: Amiga, Price: £8.95

Originality: 5/10, Playability: 5/10, Graphics: 5/10, Value: 5/10

Karate King

This game is a karate 'simulation' where the Amiga is used to create some stunningly beautiful backgrounds. Against which, you create your mayhem while you battle a

two either against the computer as the Red Fighter, or "between friends", with an opponent.

The mouse is not used with this package, and a joystick is required for all sixteen screens. The Amiga handles the graphics with such ease that the red fighter seems to almost swirl as he lunges at you with some pretty nasty kicks.

The sound effects are very good, with sampled shouts and cracks, and a few good groans as well. The problem is that I don't really know what I am fighting for! The immediate aim is fairly simple though - to knock the red fighter unconscious so that you can move onto the next screen.

After each bout there is a short interlude as some unseen opponent throws bombs at you from the sides, which have to be destroyed before you can move onto the next screen, and exactly the right move is required to shatter these into pieces.

This is a good combat game, with some very clean graphics and some nice music to boot (you interested). All nine screens are beautifully presented and although the game is very difficult in the first three or four screens, it does not get as difficult as would be expected after level six has been reached.

The joystick in port two controls the white fighter. The red fighter has the advantage of being more powerful than the white fighter, and at higher levels he also has various killing devices at his disposal, including starvation, throwing darts and so on...

As you progress, it seems that some types of punches are more effective than others. For instance in the first level, you can use just about any blow you wish, but in the second level a kneeling punch or a low kick seems to work wonders!

If you are defeated by the red fighter, a couple of birds fly over you and your opponent (probably will continue on the floor) with a banner proudly proclaiming his superiority. They fly off and it's time for more mutilation and mayhem... all good clean stuff.

Karate King is the best version of this sort of game I have seen running on any machine and the ease with which the Amiga presents each movement forces obvious looks from all the non-Amiga users I have played this game with. This would make an ideal first time purchase for any new Amiga owner wanting some back and play software to while away a cold evening.

(C.G.)



Footnote:

Name: Karate King. Supplier: Amiga 15 Year Old Dazzled from 241 W.C. Tel: 0127 521159. Price: £9.95. Originality: 7/10. Playability: 7/10. Graphics: 8/10.



Hardball

Imagine you are in the good old US of A and you are at a major league ballpark just before most of the fans have arrived. The sun is shining and the hot dogs have been cooking all summer; you find yourself a seat with a good vantage point (let's say just behind the batter) and you sit down ready for the day to begin.

Accolade Software have really gone to town on the packaging for this one. Hardball is a game that has not only captured the essence of a major league baseball game, but I believe, will successfully make the transition from America to Britain with commendable ease.

Hardball - In America - is a game that is played on a pitch like rounders, using the strategy of cricket, and has the popularity of football, add to this the tactical strategy of a small (and possibly) South American country with a large nuclear arsenal, and I think you'll get the gist of this slice of American pie.

So, armed out with baseball bat, a six pack (of cheap Coke) and my Amiga, I booted up the game and prepared myself for a whole new experience.

First of all, you are given the option to use either a mouse or a joystick. You can play Hardball against the computer, against friends or even see the Amiga to play against itself!

From here on, you are going to have to learn a number of things. Firstly, you are going to have to know how to play baseball. This isn't too difficult, as the game is essentially the same as rounders (i.e. hit a ball and run like hell) but unlike rounders, there are an infinite number of between who decides whether or not the ball is in the "strike area" (for more information, just see the Whitman "Bad news Bears" (the which is, incidentally, all about a bunch of bears in the league, and you'd soon pick up on how things work in the game).

Another thing you will have to know is the ability of the

from you are currently waging war against. The tips in the back of the handbook are reasonably useful - should you happen to know baseball jargon - but the best way to get to know an opponent is to see how he reacts to a pitcher's throws, and this is where pen and paper come in useful.

Play begins with the pitcher's screen, depicting the pitcher, the batter, and the well-protected umpire. You are looking from the umpire field and are able to control either the 'Champs' team or the 'All Stars'. If you are the team batting, you simply decide which is the best type of strike to attempt (don't forget you don't have to try to hit a ball - if you don't think you can hit it, the umpire usually agrees with you).

You give the ball a great big whack and you run around the pitch, passing as many of the bases as you can. If you get there before the ball, then all is well; if you don't, then you are out, and the crowd squeals in delight - nice to know when your friends are!

Pitching is even better? You select which is the best (or rather worst) throw for your opponent (i.e. can you get the ball past him three times, with the umpire calling 'strike' each time?). If the batter hits the ball, the screen clears to display the field, and the ball slowly arcing over to one of your fielders. You, with mouse in hand, then take on the role of fielder and move the chosen player to meet and catch the ball, and then throw it on to the next base or from the runner - like rounders, you are to try to get the ball there before the runner, and so catch him out.

The attention to detail is amazing! In the corner of the screen is a Barnacka box, propped up against a wall eternally blowing gum. The crowd murmurs excitedly between pitches, and cheers wildly whenever anything goes in. The sound as the bat strikes the ball is very realistic - a wonderful 'crack' that could have inspired Sir John Belushi's 'sound of leather on solid' quote.

The animation is very smooth, especially when pitching the ball, or when you are batting; and when the scene changes to the field, you can run about with the selected fielder flashing on and off until he throws the ball. As a batter runs against an approaching ball, they slide into base in a cloud of dust and gravel... great stuff!

Substitutions are easily made.

Should you find a man beginning to sweat under the strain of being active in the field for too long, and should you work out the playing tactics of a pitcher as batter, then you can improve your chances of beating him by selecting a more suitable opponent, so there's quite a bit of thinking to be done as well as playing.

Hardball is an amazing game; it is delightfully free of violence, and it has captured not only the competitive spirit of the game, but also, I believe, the atmosphere of the ballpark, the excitement of the crowd and the smell of those lovely scorching hot dogs!

C.G.

Teacher:

Name: Hardball. Supplier: Activision. 3043 Stevens Creek Boulevard, Cupertino, California 95014. Machine: Amiga 128.

Difficulty: 8/10. Playability: 8/10. Graphics: 8/10. Value: 8/10.



Challenger

Another one of Amiga Software's 'silver' range of software packages for the Amiga. The aim of the game is to collide as little as possible with the objects at the upper (grey) level and the lower (green) level on the screen. Player one uses a joystick, plugged into port two, which is used to control the speed at which the green background scrolls past and determining the rate at which the blue ship moves forward. The computer, for player two, controls the rate at which the grey background scrolls past, as well as the flight of the green ship, if played in 'two player' mode.

The players pilot their space ships and try to avoid colliding with either the landscape on the grey level, as such impact causes an energy drain. If the way ahead is clear, you simply accelerate, hopefully causing your opponent to collide and explode. The upper level is filled with a latticework of anonymous, nondescript grey buildings, occasionally labelled 'hard here' (you can't), the lower with trees, shrubs and more small buildings. After the third, 'underwater' level, the game improves a little - but not much, and certainly not enough to distract you from wondering how the spaceships got underwater in the first place.

Challenger is essentially a 'dodge out of the way' game with eight different levels. The problem is that there is very little substance to the game, as all that you are doing is dodging out of the way whenever an obstacle in the lower or upper levels approaches. A basic explanation as to what the type often found in accompanying novels might have relieved this, as at least there might be an underlying goal. As it stands, the verbal lines of instructions are clearly not enough.

Instead, the game revolves around the one (or two) spaceships, which are controlled by joysticks; note that neither the mouse nor the keyboard are used here, which is unusual, and annoying, in that not all users will have joysticks for their Amiga, and this will seriously limit the game's appeal.

Playing the game is a rather unenjoyable and boring affair as you are simply avoiding the trees and bushes and the various ground based buildings, while keeping an eye out for

the upper 'grey' level buildings that seem to sweep past you, and anyway how can buildings exist faster than the ground they are supposedly supported by?

One interesting aspect of *Challenger* is the method of scoring. For instance, I was starting a new game when I suddenly abandoned the joystick, allowing the ship to carry on unaided for a short while, until it ploughed into something that can be best described as a runway with 'land here' prominently emblazoned on it (I told you, you couldn't!). The high score table told me that this was worth 64,000 points, whereas a controlled flight lasting a good few minutes was worth only a few hundred points!

Now either I'm going crazy, or there is something seriously wrong with a scoring system that takes absolutely no account of flying, dodging or tactical skills whatsoever!

Playing against the computer is even less enjoyable, as nothing new happens. The sound effects are virtually nonexistent, while the ships themselves are unimpressive. They consist of one dimensional objects that do not fit in with the otherwise well-designed graphics, nor do they look anything like the ship in the loading screen. Even the explosions are unsatisfying!

The loading screen provides something of an anticlimax in that the long list of credits seems to promise more from the game than it actually delivers. I am well aware that this is a low price game, but the waste of the Amiga's facilities is reprehensible, although Amco have proved, with games such as *Rainbow King*, that they can provide excellent software for this machine, that relies on capabilities to the full. Software of this ilk usually tends to be restricted to free distribution among user groups and public domain libraries.

All in all, I would give *Challenger* a miss, unless, of course, you have money to burn.

C.G.

Touchline:

Name: *Challenger*. **Supplier:** Amco, 21 West End, Bedford Ave B&I 2EC. Tel 0472 85111/18. **Marketing Agency:** Polaris UK Ltd.

Originality: 2/10. **Playability:** 2/10. **Graphics:** 4/10. **Value:** 4/10.

Brian Clough's Football Fortunes

Will the Americans have had it their way with *Football* but CDS Software have converted a popular program across to the Amiga which offers a little bit of English culture for this primarily American machine.

Brian Clough's *Football Fortunes* has the unusual approach of being probably the world's first computer game that plays side by side with a board game. It is suitable for two to five players and each player takes on the role of a football club manager.

The object of the game is for each player to successfully steer his team through the season, using his skill to make the team stronger as the games proceed. Each manager competes against both human and computer controlled teams in a ten-strong first division for the league championship and, of course, the F.A. Cup. From the second

season onwards, each team will compete towards the European competition, through the usual practice of league champions going through to the European Cup, the FA Cup winners going through to the European Cup Winners Cup, and the remaining clubs going on to the UEFA Cup.

The winner of Brian Clough's *Football Fortunes* is the manager who survives to the end of the game and has the highest number of game points. Game points are those awarded by the computer and are based on each manager's performance in the league cup competitions, and on the amount of raw cash he has managed to accrue and, more importantly, retain, by the end of the game.

Sounds familiar? You bet it is! Brian Clough's *Football Fortunes* is simply a well presented and very enjoyable variant of the old board game of *Monopoly*. The main aim of the manager is to create as strong a team as possible, by increasing the star rating of his side. However while doing this, he must not neglect any section of the team or he will lose matches, nor must he overreact as the scales of fate sometimes tip unacceptably against him at a time when you could easily do without the extra hassle.

As well, such is the stuff of which football managers are made, and if you can look after your bank balance while retaining your star players, then you could go far.

Footballers are purchased from other football managers and a player can also obtain star material from Auctions, this must be done shrewdly and with skill - you see would all like a world cup goal scorer in your team, but unless you can survive buying him, and you gain the results you expect quickly, then you may just as well have thrown your money down the drain, as a foolish purchase can cost you your job - and nobody knows more about getting the boot than Brian Clough!

The game is most or less managed by the computer, but don't think this is a quick 30 minute-to-play job, as playing Brian Clough's *Football Fortunes* can take anything from a couple of hours to a whole afternoon, depending on how many people are playing.

The computer doesn't do all the work for you, it provides lots of forthcoming features, the current league table, details of points scored by both clubs and managers throughout the game and the chance cards allotted to players, as well as the all important printout of results on the screen at the end of each league game. This is in the same way that the results are presented at five o'clock every Saturday afternoon during



the football season, but you do need to look after the way cash is spent, as well as making sure that the pitch does not fall into disrepair and that occasional reinforcements are made as required.

After each match, the manager can receive his game money from the banker. He will be given half of the amount shown by the monitor, and the size of the game receipts depends, of course, on the larger positions of the teams playing any given fixture. For example, playing a top-flight team could be a big pay-off for all concerned, if the two teams were well-matched. However, if you are scraping around the bottom of the league, then I wouldn't recommend headbanging the bank trying for the summer treat of South America!

This is an excellent strategy game - probably one of the best of its genre as it requires methodical thinking and almost brutal planning ahead, but then that's life at the top!

Brian Clough's Football Fortunes is also an unusual game in the way that it brings the players together more than if it were, say, a completely computer-orientated game. The graphics are nothing special, being mainly rather chunky - but colourful - menus, but then managing a football team gives you more to think of than mere fireworks.

Full marks must go to CDS software for their packaging of Brian Clough's Football Fortunes; the 'funny money', the cards, the board and the instructions all come together to make an excellent package - perhaps not family entertainment, but a great way to amuse your friends for an evening. Oh, and if you should have any problems regarding the game, there is a special Brian Clough's Football Fortunes hotline set up by CDS software. Now that's what I call dedication!

G.C.

Football:

Name: Brian Clough's Football Fortunes. **Supplier:** CDS Software Ltd, CDS House, Archers Road, Dromedary, S92 4AB. Tel: 0202 211134. **Machine:** Amiga. **Price:** £20.95. **Originality:** 10/10. **Playability:** 8/10. **Graphics:** 5/10. **Value:** 7/10.

Balance of Power

If you enjoy a mental challenge, against human or computer opponent, then Balance of Power, Microsoft's Mindscape strategy game of geopolitics, will not disappoint. The game gives you in the shoes of the American President or the General Secretary of the Soviet Communist Party. Your judgement and temperament will determine the outcome of an eight-year long cold war. The object is to win prestige and influence in the global sphere, without instigating a holocaust - the ultimate failure in B of P. A score is maintained and can be viewed at any time.

Each year you support insurgents against the enemy as well as political allies under threat, with both economic and military aid. These hotspots are where each opponent can throw down the diplomatic gauntlet and may begin a crisis. You must decide when to back down as well as when to stand firm.



The local scenario will be recognised by anyone who reads the foreign news in the paper. Indeed B of P uses its own newspaper reports, as well as private information sources on minor countries and on the super power combinations, USSR and USA actions for each current month (a year in game terms) and for past years is also available.

This variable information is combined with a large collection of static data about all the 'countries' represented on the B of P maps. The maps are what make the game, offering information quickly and attractively in association with pull-down menus. It is not just sifting the menu on different countries to gather information about the economy, population, GNP and military spending. There are details on education, health, violence in society and political inclination. Data goes right down to the number of television or telephone per capita.

Your first eight years of negotiations is just for beginners. The intermediate grade introduces the intervention of foreign governments, Coup d'Etats and the new policies of economic aid and destabilisation.

The expert level introduces treaties based on diplomatic, trade or military co-operation and the pressures that can be brought to bear by large or small through these means. The aim here is to prevent the 'Finlandisation', i.e. going over to the other side of the allied countries. The 'nightmare' level is the same as expert but with the odds stacked for the human player against the computer or for one side in the two player game.

B of P requires a well presented manual containing plenty of background to the game and its underlying rules. It's a tough game to play and its detailed design is enthralling. And it doesn't matter which side you choose, only a cool head and the ability to learn from your mistakes will see you through.

This is another highly priced software package but I won't complain because there are hours of enjoyment here in a very nicely produced game.

A.C.

Football:

Name: Balance of Power. **Supplier:** Microsoft, Athene House, 25-25 Silver Lane, London EC4P 4AB. Tel: 01-337 0445. **Machine:** Amiga. **Price:** £39.95. **Originality:** 10/10. **Playability:** 8/10. **Graphics:** 8/10. **Value:** 8/10.

The Desk Top Video Market

By Anne Owen

Many people believe that the Amiga is going to dominate the Desk Top Video (DTV) market in the way that the Apple Macintosh has cornered Desk Top Publishing. Software packages are emerging which allow microcomputer graphics and video to combine powerfully, both at professional and amateur levels.

3D on TV

Amiga, already renowned for their graphics software, such as Animapaint, on the Amiga, have released the \$199.95 VideoScope 3D graphics and animation package. Amiga are pitching it against expensive professional software like Digital Art's DOS system and Cubicomp Corp's PictureMaker.

A minimum of 512K is required to generate 'television quality graphics', although Amiga suggest 2Mbytes and a dual drive system or hard disk. The software consists of Designer 3D, created by Colin French, for making 3D objects; PlayANIM, created by Gary Bonham of SpartaFilm, for playing animations back in real time; and VideoScope 3D, created by Allen Hastings, for making finished videos. There are also utilities for creating common geometric shapes such as spheres, cones, rectangles and fractal landscapes.

3D objects are created either by numeric entry of X,Y,Z co-ordinates or by one of the supplied utilities or by point and click with the mouse. With DED, there are three windows representing front, side and top views

of the object. Scaling, numeric value display and numeric entry help maintain accuracy as the object is drawn. When finished, a motion file can be loaded and the object is passed to the preview window. In real time, the object can be shown in motion from all sides. Each frame of the motion file is recorded in RAM and played back at an adjustable speed.

Once the objects are created, they are loaded into VideoScope's main control panel. Here, the scenes are put together. Details regarding camera and object motion, backgrounds, foregrounds, horizons and other information are determined, and a complete scene is created. At this point a video cassette recorder can be hooked up to record the scene one frame at a time, or a few seconds at a time using the PlayANIM module. Frames can be previewed either manually or automatically at any time, and their settings can be changed on the fly.

To create an ANIM file requires at least one megabyte, although they will play back in 512K. An ANIM file can compress a 4096 frame into less than 1K. Jeff Kravitz, computer graphics expert and Richard Lewis, production designer for Max Headroom, are using VideoScope 3D to create background logos as well as some on-screen wireframe animation for the well-known show. So watch your screens.

Animator's Apprentice

Animator: Apprentice software, written by Hash Enterprises is

designed to generate frames for animation in 4096 colours. The Apprentice costs \$199.99. Two dimensional images are turned into 3D sculptures by 'Sculpt'. Character movements, called 'actions', are defined with another interactive module and are applied to the objects in 'Director'. Here characters are positioned, the light source and camera focal length set and the scripts written.

Each frame is generated automatically, taking between five and twenty minutes (which is quick!). When finished the frame can be recorded to video. Playback of frames in near real-time on the Amiga is also possible.

Animator comes into the category of organic animation and is strong on representing people and animals with naturalistic shading. It is for the budding Disney who wishes to put together story-rolling with characters rather than logos, fly-bys or mathematical shapes.

Marin Lowe, of the Amiga Centre Scotland - who markets Animator in the UK - has distributed what must be the definitive list of software requirements for Desk Top Video:

1. Extensive graphics and sound capabilities.
2. Convolving capability (for mixing video and computer graphics).
3. Overscan (no screen borders).
4. Real-time playback so that editing can be done off frame video recordings.
5. A timer program.

6. A HAM (hold and modify) in 4896 colours, paint program.
7. A Video digitiser for ingesting pictures into the computer from a video camera.
8. A 32 colour paint program.
9. An 'organic' 3D animation program.
10. A 'mechanical' 3D animation program.
11. A special effects program (wipes, screen splitting, etc).
12. Other animation programmes which perform specific tasks (such as water, clouds, mirrors, etc).
13. A mouse or tablet for artistic input.
14. An editing video recorder.
15. A 3D animation program.
16. An audio digitiser.
17. A music program.
18. A sound synthesis program.

I'm sure you can identify some of the software and hardware above; the majority of which is now available for the Amiga. If you have ideas of your own about combining Amiga and VCR don't keep them to yourselves, drop us a line. A professional setup with all the above would cost an arm and a leg. At home you can start out with some good animation software

with real-time playback, a home VCR to record the screen and a cable to plug them together.

Ray Tracing

Following the popularity of Eric Gribben's Juggler animation, ray tracing could become this year's computer lull. Eric's ray tracer software is available from Amiga Centre Scotland, but because it isn't an animation package, it only generates a single frame at a time. Eric is working on an animator for his ray tracer generated images but in the meantime just putting together your own picture is a fascinating exercise.

To create a picture, the positions, size and colours of the spheres and lamps (light sources) have to be defined in a data file. The program ray processes the input file, puts the resulting image on screen and sends it to a specified output file. The finished file can be more rapidly displayed by the vi program. This is just as well because the original takes an age. In fact one of the useful options you can set from the command line when you call ray is the picture size. A small, and

more quickly generated, version can be used to check your input data. Other options available include a vertical format picture and anti-aliasing (blurring at the edges).

The input file contains the position of the observer, the direction that the observer is looking, the focal length of the observer's camera lens, the objects - a series of spheres, tubes and chains - the number of lamps, the specification of each lamp, the colour of the ground, the diffuse illumination and the sky.

The software is supplied with full documentation, some finished and an example ray tracer file ready to be worked on.

Summary

The software mentioned above ranges in price and power. You can try your hand at ray tracing from £11.95 - who not send us your results to share with other Amiga owners - or you can invest heavily in DTV by purchasing both Gribben hardware from Amiga Software and programmes such as Videospace - for 3D - or Animator - for organic - animation. I can't wait for the first Year Amiga video!

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MonAmiga is the symbolic, front-panel debugger with built-in disassembler. All the usual features like multiple breakpoints, single-step etc. are supported plus sophisticated search capability, multi-tasking and a backup screen so that you can see your program's output independently of MonAmiga's display.

Devpac for the Amiga comes with a full, ring-bound manual with tutorial and the Motorola 68000 Programming Pocket Guide.

HiSoft The Old School, Greenfield, Bedford, MK45 5DE. (0525) 718181

Amiga Promise

*Now, there's no excuse for poor spelling,
and that's a promise!*

By Anne Owen

Promise by 'The Other Guys' is a stand-alone spellchecker for the major Amiga wordprocessors, boasting a 95,000 word dictionary, a spelling helper and a punctuation checker. How do these features match up to the task of keeping your copy clean?

Because spell checking is a necessary evil rather than an entertainment, I am happy to say that Promise does not mess around. A simple file display with click/frequency boxes for files and directories is used to select the file for checking. In a similar fashion 'visions' dictionaries (those you have created yourself) can be loaded into RAM, where they merge and are used in tandem with the main dictionary to check the selected text file.

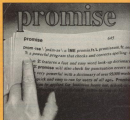
When activated, Promise rapidly detects any words unknown to it (not necessarily incorrect) and prompts you to either correct the spelling or go on checking. You can specify whether any change or ignore should apply 'just this once' or for 'all occurrences'.

Any word which is unknown to Promise can also be added to the custom dictionary which can then be saved in its amended form for later use. When correcting you can make use of the 'help with spelling' feature. You just click on one of a number of suggested words which are listed in Promise and your selection is imported as the correction.

The 'Spelling Helper'

A close relation to the above is the separate 'spelling helper' which can be opened as a task on its own and used while editing (or doing a word puzzle, crossword, etc). You can look up spellings and words using wildcards in place of the letters you are unsure of, e.g. p***** finds all seven letter words beginning with p; n**?e will find the correct spelling missing; * is substituted for any part of a word, e.g. p*ch*try which is unknown. Great for Scrabble chess!

The punctuation checker works alongside the spellchecker when activated and finds punctuation which does not correspond to its basic rules. A correction is suggested which can be accepted or refused as with spelling. Promise checks for double punctuation marks (usually a typing mistake), lack of a space after a punctuation mark, commas and full stops outside quote marks and colons and semicolons inside quotes.



I discovered to my surprise, that our review version of Promise did not operate correctly with Kickstart 1.2 or 1.3. Only my old 1.1 on the A1000 got me going to check, with Rubick, the UK supplier (01-647 4457) on compatibility, with your system before buying. If you can get going, then Promise is excellent for batch checking files and really comes into its own when instantly available in its own hard disk directory. The manual explains such operation, including backing up and hard disk installation in a step by step manner so there is no room for misunderstanding.

Because wordprocessors/text editors like Textcraft, Edit or early Scribble do not have spellcheckers of their own, Promise can do a good job filling the gap, though at a fairly high price. Promise files have a number of codes embedded in them so Promise is not really suitable. If you use Scribble II or have invested in WordPerfect then Promise offers nothing over and above the excellent checkers you already possess.

File/line:

Name: Promise Spellchecker. Supplier: Rubick Ltd. Unit 4, Silverthorn Business Complex, 30, John's Road, Silverthorn, Middle. Tel: 01-647 4457.

Book Review

There's no need to be bogged down with heavy reading when you're learning about the Amiga. A recent publication from Ariadne seems to have provided the answer.

By Clive Grace

The Amiga is to many people a closed machine; there are no advanced reference manuals readily available to the first-time user, and the massive four volumes of the 'Technical Reference Guide' published by Addison Wesley is considered heavy weight reading matter and is really only suitable for the machine code programmer who is already adept at programming in the Amiga's native tongue.

The 'Kickstart Guide to the Amiga' is, by contrast, a smaller tome. Published by Ariadne Software, this large format paperback book has 250 pages and contains so much information, I had to put the book down every ten minutes to stop myself getting overwhelmed by the sheer mass of information.

The 'Kickstart Guide' is written from the point of view of the serious software programmer who has, for the first time, delved into the world of 16-bit computers only to be confused by the extra memory and facilities that the Amiga has over other machines in its class.

The book is thoughtfully divided into three sections; part one is an introduction to the Amiga, and I couldn't wish for a more comprehensive introduction to the general hardware. It satisfies the craving for more information after devouring the BASIC reference manual and the Amiga 'Welcome' manual for the first time.

The opening chapter serves to explain the 68000 processor, its interrupt handling facilities and its rather over-ideological register handling system. The introduction explains how the 68000 fits into the Amiga's working environment and where necessary, it gives comparisons from the more familiar world of the 6802 processor, as seen upgrading from their C64's or C128's will find it easier to understand the complex interrupt facilities the 68000 has to offer.

The second section is divided into five smaller sections, and attempts to explain I/O streams, how to access various devices and setting up a few serial ones of your own. This chapter goes on to setting up multitasking operations leading off with an intriguing chapter called 'Serial port debugging, and the Joy of Whack' - sounds like fun!

Have you ever wondered what those numbers are at the end of the 'Guru Meditation' message? The Kickstart Guide not only tells you how to translate them, but also explains when an error in an operating system crash, a hardware fault or an applications bug, and there are ways of retrieving information after the Guru has meditated. Ooooooooooooo.

The Amiga's famous graphics capabilities are uncovered, possibly for the first time, and the book goes

even further by discussing how the graphics can be more freely accessed through the Amiga's 'copper' co-processor hardware, and introduces us to the special custom chips named 'Paula', 'Agos' and 'Demic'. These chips can be used to obtain beautifully fluid computer animation by synchronising the blitter and huffman chips to the screen 'bitback state'.

The third section is an introduction to 'C', and promptly pushes you off at the deep end into programming with arrays, strings, data pointers and all of the most useful things you will need when programming in a new language for the first time.

While this section does not purport to be a definitive description of 'C', I would, however, recommend this section to programmers wishing to sample the delights of this powerful programming language for the first time. It does jump ahead of itself at times, but with a little more taking, many of the trivial questions regarding 'C' are answered. Interestingly enough, the style of the manual becomes less chatty, underlining Ariadne's serious commitment to the 'C' language.

There are quite a few examples in 'C' short enough to go through without resorting to buying a 'C' compiler, but as many of the serious programmes and games are written in 'C', it seems sensible to think of 'moving up' to 'C' at some point or another.

In all, 'The Kickstart Guide to the Amiga' is a competently written in a friendly style without too much rambling on about how 'amazingly wonderful' the Amiga can be, if only you could program the darned thing!

The most important thing about this book is that it is written in a style that is very alluring, moreover, it inspires confidence in the programmer and while this initially leads to a few monumental mistakes, it also puts you on the road to experimenting with the Amiga, which is a good deal more interesting than just pushing the mouse around your desk... although that can be fun as well.

This is an excellent book and necessary reading if you have an Amiga; be it a 1000 or A300 or even the A2000. If you are thinking of getting an Amiga then this book may just tip the balance, I can't imagine what my Sunday afternoons were like before this book!

Twinkl:

Title: The Kickstart Guide to the Amiga

Publisher: Ariadne Software Ltd, 373 Kew Road, London W9 3JN. Tel. 01-948 8265. Price £12.95 (pb) 145p.

ProWrite

New Horizons have come up with a wordprocessor with a difference - ProWrite offers colour, high resolution and graphics in text.

Abstract

First impressions are always good with New Microsoft software. The packaging and manuals are up with the best for any micro. ProWrite's "bold but" manual is especially friendly, pitched at the beginner but with full index, glossary and hints to feature explanations. Request letters and memos are printed alongside text for ease of recognition and there's a beginner's manual incorporating one of the three examples of text on the disk.

Figure 6

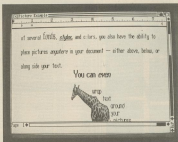
ProWrite is different enough from any rival software to prompt the question 'what do you want from your wordprocessor?' Personally I decided I wanted high resolution (native mode) but I couldn't cope with the flicker on my 1080 monitor. ProWrite's default background colour is paper white and a dammer (SHFIT+HLLP) is provided with one dozen flicker-a-lots. Also some modes

is the product Jitter-Red, a screen which filters over the monitor but I didn't get the chance to test this out. The best and most expensive answer is the Commodore 2080 long persistence monitor. I have returned the medium resolution version of ProWrite as my default ProWrite to boot screen.

I also decided I like colour on buttons. There are seven to choose from, corresponding to the seven ribbon colours available on a colour dot-matrix printer. The standard font and three others, Classic, Marble and Serpents (12 point on 15 point only) can take any of the colours, different colours for alternate characters if you really want!

In combination with a colour printer and colour photo-copier, ProForm can be an effective specialist wordprocessor for the editor/designer of a journal or year, children's worksheets (colour is a very effective tool in education), overhead transparencies (depending on the printer again), and any presentational material in which text is a vital element.





Of course you can print out from ProWrite in black and white, draft, NLIQ or standard. If you wish to print out on a daisy-wheel then tape 11 point has to be used to get the correct formatting. Standard here means a graphics printer which reproduces the fonts on screen as well as the italics, bold, subscripts and so on. Colour is nice but it's expensive to deliver on paper.

No Doubt about Graphics

Without qualification I welcome ProWrite's ability to combine graphics and text. ProWrite allows you to cut out a rectangular block of IFF graphics, created in a 'paint' program. This is achieved by opening a second document and loading the graphics. At this stage you are prompted to choose the degree of shading to apply to the graphics, full, partial or none. The choice depends on the picture and the printer. Once 'cut', the graphic appears in the top left-hand corner of the text document in which you 'paste'. You can then move the graphic around the document to wherever it looks best. Text can take on the background colour of the graphic which creates a very impressive feature when printed.

Unlike a program such as GEMstone, ProWrite lets the text flow around the graphics box, it doesn't have to stop above and below. You can even type into the spaces in the picture.

I have begun to experiment with clip art: dinosaurs in the background of a draft letter to the bank manager; fun things like teddy bears — I suppose it should have been a man or plover — on children's stationery. Graphics can also be used to impress. A 3D graph from Argis Impact can nicely explain (and/or) some figures. Even the figures themselves used as an IFF file (you Zong or Gabbler) from Analyst can be used as a table. Company logos, letterheads and standard artwork can also be created and load and save. ProWrite allows them to be incorporated into displayed footers or headers.

Standards

ProWrite lets you have a number of documents open at the same time, each in its own window which can be sized or placed in the background or scrolled. Text can be moved or copied between windows. Each layout is controlled by the margins, indents and tabs set on the ruler at the top of the document. Settings apply to individual paragraph blocks (defined as text between presses of the RETURN key). The markers for these blocks can be made visible for editing purposes and a format can be copied between paragraph blocks.

As you type, ProWrite wraps the text according to the selected format, e.g. justified, centred, double-spaced, etc. ProWrite indicates page breaks as they occur. Footers and headers are entered via a menu option with a number of page numbering styles to choose from. They can be displayed on screen if required and there's an option to turn the header (and footer) off for the title page.

The pull-down menus give a good idea of the more standard features of ProWrite. The search and replace operation is particularly friendly through the use of on/off buttons and check boxes with which you can set the exact search pattern you require. The keyboard shortcuts, the keyboard equivalents of pull-down menu options, some of which are on function keys, are also vital for the regular user.

Summary

I very much enjoyed using ProWrite. Although it does lack a spellchecker and supports only *Profont* printers, (and you can't print marked sections of a document, only a minimum one page. The £100 plus price tag makes it an unlikely buy for the beginner, which is a shame because ProWrite is very easy to use. ProWrite can achieve the more ambitious print projects you may have in mind, which is much nearer. In respect of graphics and colour ProWrite is out on its own, but is it also ahead of its time or your hardware budget?

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- Battle Tote
- Blackwood Tote
- Brownie Bag
- Chin's Va
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- Hatchbacker's Guide
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100

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AC Polaris	020
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Amos C: Professional	010
Amos C: Developer	020
Amos C: Commercial	000
CI Image	03
CI Suite	00
Lotus	010
Lotus C: v3.10	037
Microsoft Works Assistant	00
Microsoft Paint	00
Microsoft Word	00
Microsoft Word	00
Module 11 (Standard)	00
Module 11 (Developer)	000
Truevision (Truevision)	00
Truevision (Truevision)	00
Truevision (Truevision)	00
Truevision (Truevision)	00
Truevision (Truevision)	00

Abstract

Analyses 11	£10
Logistics	£10
Management	£10
Cost (Professional / 2000 hours)	£10

Figure 1

Acquisition	Price
Old Man, Dillan W. (COW)	875
Cowboy Film	800
Surfboard Film II	875
Surfboard, Starboard	875

[illegible]

David Scott (20,000 Ford Bronchos)	83
Mandy (2000 Ford Bronchos)	83
Joe Smith	87
SCORE	87
Time	87

Figure 1

TABLE 1

The following brief response to the article by 2009 and 2010 at the time
proceedings were proceeding for the and that these had indicated for the

graphical data for individual components in 1-year spans of time available

1000	1000	1000
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Please go to the first page of a presentation in the Strategic Plan website prior to using the program "Using a Strategy" software tool for your 2008 presentation on the topic of "Global Talent Development".

[illegible]

1818. Theaters around the nation. Not only does the standard fare of tragedy, melodrama and comedy exist, but there are also companies mounting new or revised plays, sometimes by Shakespeare, but with the addition of the features mentioned previously. Read, and these actors flourish.

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Abstract

Two of the most important works published in the 1970s are *Justice and the Social Contract* and *The Principles of Justice*. In these books, Rawls argues that a just society is one in which the basic principles of justice are chosen behind a "veil of ignorance" in which individuals do not know their place in society, their talents, or their wealth. This ensures that the principles are chosen from a position of fairness and impartiality.

It is submitted to your Honorable Court that the award of the contract to the lowest bidder, the defendant, was a legal and proper exercise of the power of the Board of Public Works, and that the award was not subject to the review of the Court.

HARDWARE

[illegible][illegible]

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Digi Paint

Stretch the graphics capability of your Amiga to the full with this up-market arts package.

By Clive Grose

The Amiga is, as everybody knows, a stunning graphics computer; it has enough memory set aside for all but the most demanding of applications and to make life even easier, there are a number of screen 'modes' offering various resolutions and colours suitable for various applications.

The Amiga can display a maximum of 12 colours, which can be logical colours, or shades of any particular colour, or, black and white 'grey scale' colours.

One of the least understood and most underestimated of the screen modes available on the Amiga is the 'load and modify' video-display mode. Initially it was considered something of a curiosity, enabling colour palettes to be shared on the screen at the same time. To the best of my knowledge, no package has yet used this facility to the full.

With the HAM mode, the Amiga can display all of the 4096 colours in the same time, which is no mean feat. And when you consider the many hours that have gone into the programming of this new screen mode, it is amazing that the software was finished at all!

Introducing Digi Paint

Digi Paint is a new software package which is quite frankly, comparable to professional graphics workstations which cost many thousands of pounds. Digi Paint is capable of working in, and displaying, very high resolution pictures using the HAM mode, in both the 320 x 200 and the 512 x 400 resolution modes.



Digi Paint reads standard BE-Files, so if you have drawn a picture using any art package, for example Deluxe Paint, or if you have a digitised photograph, you can quite happily load screens in and modify them using Digi Paint. Indeed, New Tek regard Digi Paint as a companion software package to their Digi View video digitiser.

The HAM mode uses six-bit planes to display images, which means that each Pixel uses six bits to determine its colour. If the first two bits are '00' then the remaining four bits are used to determine the pixel's colour, thus giving a choice of a possible sixteen colours from the total of 4096 available.

If the first two bits of a pixel are

'01', then the pixel has the same colour as the pixel to the left of the bits are '10' then the last four bits (remember they are the ones that determine the pixel's colour) replace the green value, and if the first two bits are '11', then the last four bits replace the blue value.

The effect of all this is that you can display all 4096 colours on the screen at once, although you cannot change from black (red, green and blue all set to '0') to white (red, green and blue all set to '1') immediately. However, such a small limitation is hardly noticeable when using any HAM mode screen.

Naturally, such efficient house-keeping takes a lot of programming, and for the Amiga 500, Digi Paint



requires just about every byte of memory it has to offer, so if you still have a 256K, Amiga 5000, now may be the time to think about getting that memory upgrade you have been considering.

Using Digi Paint

The Digi Paint package contains a single disk, and a manual and to use it, you simply boot up the disk from the workbench prompt and you are then greeted with the Digi200 and Digi400 icons. You can examine the drawers holding Digi Paint artwork by opening them up. Once opened a miniature of each of the screens is displayed as an icon. This is very useful, especially as you can enter the package by double clicking the icon you wish to edit.

Both the 200 and the 400 resolution programmes have the same screen and menu displays, although the 400 resolution is 'non-interlaced'. Really, you need a slow refresh monitor to stop the screen flicking, however the standard HRS monitors run very well while using this mode.

The whole of the screen is used for your artwork, leaving a status window at the bottom, crammed full of options, including brushes of various shapes and sizes, a pair of scissors for cutting and drag for 'brushing' elsewhere on the screen, or for other files, a magnifying glass for really close up work, and a very comprehensive fill option.

Other facilities include being able

to pick a colour from the picture you are drawing on. For example, flesh tones are some of the most complex colours a painter can achieve, but if you are using a digitised colour photograph, these tones are instantly accessible by simply clicking the 'pick colour' icon and moving the arrow to the desired position on the screen.

The ability to take a colour from one picture and move it to another is a very useful feature. Have you ever taken a black and white photograph and later wished it was in colour? Well, with Digi Paint you can simply take the digitised image of the photograph, transfer the colours from another photograph (or even from the colour board on the static screen) and then paint away by using the fill option. The end result can be very effective, especially with old fashioned photographs, such as the presidents of America supplied with the 'Statue' graphics on the disks.

Should you have drawn something that didn't work out as planned, you can 'undo' that portion of the drawing a little like stepping back in time to a point before you committed something to the screen. You can also repeat options by pressing the 'again' icon, enabling you to quickly repeat operations that require complex actions.

Brushing Up The Art

Delivering is a process used by many 16 bit art packages to obtain shades of

colour. For example, by having alternate pixels of red and yellow, a computer can generate an orange of sorts. With the Amiga, even subtle shades of colour can be created using dithering, so that a possible 65000 shades of colour can be obtained, comparable to the total colour capability of a Quantum graphics workstation.

The colouring of black and white pictures has become quite a heated issue in the world of cinematographers, some of whom take offence at the false colouring of old films in order to give them new life and lustre. For black and white photographs however, Digi Paint has some very real applications. For instance, once you experiment with combinations of face make up (assuming you have the right colours to begin with) or sketch out ideas for costume decoration and clothes design.

For the sheer fun of painting, the computer can be a very expressive tool, but after being so used to the limitations of 8 colours on other art packages for other machines, the choice of colours can be somewhat confining. The mouse is an excellent tool for drawing with, although I have yet to use a graph pad in conjunction with this piece of software.

Custom shapes can be manipulated for added depth and realism. A circle can be drawn with both the 'fill' option and the 'shading' option set, and this will draw a wonderfully hairy circle with concentric circle patterns running around it. By altering the 'width' slider to make the effect of the dithering less localized, the concentric circles change into fuzzy balls, not dissimilar to Voyager photographs of some of Saturn's moons.

Of all the menus on the screen, the Mode menu is the most useful. Digi Paint modes can be thought of as different paint types. Choosing the correct mode for a particular part of a drawing can be an art form in itself, and they are especially useful if you are merging pictures together.

More importantly perhaps, the mode effects are used to create the many subtle and varied effects possible while using Digi Paint.

The options include drawing when using solid paint, blending, tinting, light tinting, minimum and maximum painting, as well as the usual Add, Or and XOR (exclusive or) painting and painting styles available on other packages.



...There are *mask* brushes in all, these range from small circles to large diamonds and lines. There are a few basic shapes as well, including either solid or outlined circle and ellipses shapes, rectangles and squares, not to mention the *spiral* can!

For really fine detail drawing, or particularly creating blending work, the *magnifying glass* is often useful. This provides a close up image of any portion of the screen and the section you are magnifying is displayed (in real size) in the top right hand corner. You can happily perform most of the standard editing functions while in zoom mode, except for moving the magnifying glass around.

The *scissors* are used to cut out sections of a picture and move them wholesale to another part of the screen. Technically, this is creating a new brush, and the cut out portion can be used as a 'brush' file. Using the scissors with the 'blend' option set in the screen mode area can create some stunning effects, such as adding extra limbs and organs to a body. Interestingly enough, in order to create a mirror image with a brush created by using the scissors, you have to first cut out at least your 'brush' and then *reverse* the whole screen! Once pasted down, you can, of course, reverse the screen again, but it strikes me as being a little drastic!

Digital Drawings

Digi Paint is an amazingly intuitive art

could notice the difference!

The 340 x 480 resolution version of Digi Paint takes up a lot of memory, on a 512K Amiga and this can result in certain functions, such as the magnifying glass and the brushes, being inhibited. However, you can reclaim these functions by moving to the 'preferences' window and clicking off the workbench. Digi Paint does not use the workbench for itself, so it doesn't need to be active while you are using the 340 x 480 package. No problems are encountered when using 1 megabyte Amigas.

Digi Paint is an excellent drawing tool, especially if you are looking for low cost professional art package with high quality outputs - the only problem is finding a printer with a good enough output!

All in all, Digi Paint is an excellent art package. It pushes the Amiga's already impressive graphics capability to its limits, and it is a friendly and powerful package with amazing potential, especially if you are interested in modifying digitised photographs (both colour and black and white, or if you are adapting pictures drawn by other, less powerful packages.

Twinklins

Name: Digi Paint, Euphoric Newtek Incorporated, 115 W. Crane Street, Tappan, Kansas 66085.



Burning Ambitions

Clarify your knowledge of Eproms and Eprom programming with this handy article.

By Mike Connors

The subject of Eproms & Eprom programming seems now to have stimulated the minds of the average computer user over here in the UK. And not before time. For some considerable time our Dutch and West German counterparts have been whipping the lids off their computers and disk drives for a quick 'chip transplant' on an almost daily basis. Well, maybe not quite, but you only have to glance through any German computer magazine and see advertisements for a whole plethora of Eprom programmers, kernel expanders, replacement operating systems and the like to realise that we are missing out on something.

We are obviously much more reticent when it comes to touching the 'tricky bits' let alone removing those screws which lead to the inner sanctum. And yet this shouldn't be the case. After all the C64/128 was actually designed with ROM expansion in mind.

So what's it all about? What kind of Eprom projects can be undertaken on the Commodore? These fall into three main types:

Straight forward 8000 type eeprom cartridges.

Replacing internal operating system Roms with alternative or faster operating chips.

More complex 'clever' type cartridges for disk loaders, monitors, etc.

Tools Of The Trade

So what are the basic prerequisites for this operations art? Access to an Eprom programmer is an obvious one. I on the list if you wish to program or 'burn' your own devices. If you intend to buy your own programmer there are not too expensive nowadays and you can pick up a good one for around £40. Look out for one with a monitor built into the software and make sure that it burns up to 32K devices since these are now the most economical to use.

If you are to experiment with 8000 cartridges then a universal or configurable cartridge board will make this easy. These boards are available for under £10 and they usually have small DIP switches or links to make the Eprom on board

appear in various places in computer memory. If you have an old game cartridge this could be used after removing the old chip.

For replacing the internal Roms in the computer or drive you will need a connection or carrier board. This as the name suggests is a simple little device that plugs into the socket from where the Rom has been removed (24 pins) and this in turn accepts a conventional 28 pin Eprom. These usually come with a switch-on board to allow bank switching and again cost less than £10. If you are handy with a soldering iron you could probably knock one of these up using a couple of IC sockets and a switch.

A small supply of 2K, 16K, or 32K Eproms are required. Since most Commodore projects will involve replacing one or more 1K blocks we can use the bigger of the devices and use bank switching (more later) to select the banks or pages of the chip.

Eproms come in three main guises. Standard static types which can be programmed and then erased by UV light many times. Plastic one time programmable which at the same

CBM80 Autostart Routine

```

8800 00 00      cartridge auto start vector = $8000
8802 20 00      cartridge warm start vector = $8020
8804 C3 C2 CD 30 30      CBM80 Auto Start key letters

KERNAL RESET ROUTINE
Turn on VIC PAL clock.
Initialize CIA chips.
RAMTEST Clear/test system RAM
RSTOR Initialize Ram vectors
CINT Initialize VIC vectors
Be enable IRQ interrupts
BASIC RESET ROUTINE
Init BASIC RAM vectors
Main BASIC RAM init routine
Power up message

8809 20 53 04      JSR $8043
880C 20 0F 03      JSR $E20F
880F 20 22 04      JSR $8043
8812 A3 F8          LDX #F8
8814 9A            TNS
8815 .....          Reduce stack pointer for BASIC
                        START YOUR PROGRAM HERE.

```

'Housekeeping' routine that does all the things that the computer would have done had it not found the CBM80 bytes. In fact the routine is taken almost directly from the Kernal and Basic system Roms. So now on power up your cartridge would 'Boot (or) reset', after initializing the system, jump to your program at \$8025.

As you can see, if your program is designed to run in the cartridge area then it is very straight forward. However many programmers including Basic Programmers will not run directly in this way, though you can still get them on to a chip provided of course they are of a suitable size. In these cases you would use the chip as a sort of microchip which on power up downloaded its contents to the correct place in computer Ram and then jumps to and executes the code. A separate routine should be tagged on to the end of the autostart program at \$8025.

If you think this might be a bit complicated then the add-on manufacturers can come to the rescue. There are Eeprom generator programmes on the market that make your M/C or Basic program and create a file ready for burning onto a chip. All the auto-start and reloadable required is done for you. There are also expander boards available that accept up to 8x128 ROMs that can be selected from a menu on power up. As you can imagine it would be very convenient to have your word processor, database or accounts utility available instantly. Again these devices usually have the generator program built in.

Replacing Internal ROMs

There are a number of replacement operating system Roms on the market. These include faster kernels, extended Basic and alternative I/O chips. You may however feel that you don't like a particular aspect of these devices and think you can improve them or you may just want to do something as simple as changing the screen power up message and/or colours.

When modifying the kernel one of the main considerations is space since Commodore have already filled the chip with their own code. Most alternative kernels on offer concentrate on fast disk operation and so the extra space is achieved by

suggests can only be burned once. These types are less expensive but are not suited to development work for obvious reasons. They need to get used for production runs where the program is not likely to need changing. The last main type is the EEprom. This device can be erased electrically, usually with an Eeprom programmer, and re-burned many times. The EEprom is the most expensive type but doesn't require a UV eraser.

Programming an Eprom

Programming an Eprom is really a very simple operation. The program designated for your chip is first loaded into memory. This could be from a number of sources: disk, tape, another Eprom or maybe from another internal Rom in the 64/128. A good Eprom programmer will allow you to make any changes to the code via its own monitor. When you are ready to program your device first check the type and program voltage. Again the ability to support a range of devices and voltages is standard with a decent programmer. With a suitable blank Eprom in the programmer, you would usually just press a key and the chip would be burned. This takes less than a minute and the contents of the chip can then be verified against the source program in Ram in just the same way as a save to disk or tape. If all is well you would then either burn another chip or quit.

Conventional 58000 Or Basic Cartridges

The 64/128 has the ability via its internal PLA to 'use' either an external Rom or internal Ram in an 8K block from \$8000. In addition it will use either internal or external Rom in the BASIC area 8K block from \$A000. What the PLA does is simply controlled by two lines on the cartridge port. These lines GAME and EXROM when grounded will configure the computer in either of the above ways. So if you had a M/C program that ran at \$8000 or \$A00 then you could burn it into a chip and plug it into a single cartridge board. By setting the DIP switch or links to ground either or both of the EXROM and GAME lines you have yourself a cartridge based program.

Auto Start Cartridges

The above cartridge would be started by setting it into action. This would involve typing SYS (start address). This would probably be OK but the Commodore has the ability to autostart a cartridge. On power up, one of the first things that the CPU does is look at the first few bytes at \$8000 to see if the letters CBM80 are present. If these bytes are found then the CPU will jump to and execute your cartridge code.

A typical autostart routine is placed in front of your own code in the cartridge.

The above is a sort of

retaining the cassette readers. This is the most obvious way to make room for your scale since this represents about 2K. If more room is needed then the RS232 readers could also be cut down. A full disassembly of the terminals are listed in The Programmer's Handbook. The Basic RC064 could of course be given a similar treatment.

The internal ROMs are 8K in size, devices on the 64-bit bus adaptors to accept an algorithm (28 pins) is required. By having both the existing ROM and the new system with your changes onto a new 16K chip you would then be able to bank through systems at will. Most carrier boards available have this feature; indeed some offer the ability to switch through as many as four or eight banks.

Changes to drive DOS chips are for the most part experienced but minor; changes can be made easily. Again an adaptor board would be required. Some of the earlier parallel Dos systems such as Speeches consist of no more than replacement Dos/Kernal chips and a cable to the

the computer to the drive. This is perhaps a slightly more complicated one but it is certainly one with many possibilities.

Clear Time Commitment

These types include external operating systems, monitors and fastloaders. They rely on an EPROM board that can "float" in memory. This floating effect is the ability of the software on the board to switch itself in and out of the memory map. This is an obvious advantage for fastloaders and the like which need to load into all parts of computer RAM including the area under themselves and then switch out of the area.

This type of board is different because instead of EROM first being permanently set, it is controlled by the software/board itself. This affects the PLA as described earlier and you have a "now you see me now you don't" situation.

Normally, this could create a problem of the case since when the

cartridge is switched out, the code to switch it back in has gone. This is where two special lines I/O 1 & I/O 2 come into action. Each of these cartridge port lines enables or disables a page (256 bytes) at I/O 0 and I/O 30 respectively. What this means, in simple terms is that you have a page (or two) available that does not go away when the cartridge is switched out. These two pages are rarely used by programmers and so are an ideal place to position the code for switching the cartridge in and out.

If you have an old fast loader cartridge the chances are that it uses this method. These brands are generally available quite cheaply and offer some very interesting possibilities.

I have touched only briefly on each of the various areas in an attempt to illustrate the possibilities and perhaps whet your appetite. The ability to produce your own E-programs is certainly an exciting avenue and I hope this article has encouraged you to take these first steps.

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[illegible]

YORK ELECTRONIC RESEARCH

Commodore 64/Plus 4 Products

[illegible]

A sophisticated two-page symbolic assembler and load editor which supports tape and disk filing. The assembler (the editor and your source program) loads files all be retained in memory, simultaneously, facilitating load and intensive code development. Recently awarded third prize with many accolades.

2ND EDITION FROM 1993-1995 AVAILABLE IN 40 copies \$14.95

A unique integrated CISC development package. The simulator comprises 280 source code units optimized for IBM PCs which runs on the 804 at approximately one sixth the speed of a 286/486. CISC II supports all but 20 of the 666 IBM operations, runs at 80000 instructions per second, and has a 16K instruction cache. It also has a 16K code and instruction cache. The cross assembler generates hex or binary CISC object files. The disk also contains a powerful editor and several auxiliary programs.

BIDIRECTIONAL RS232 INTERFACE WITH COMMUNICATIONS SOFTWARE See 91-0144

[illegible]

Table 1

Erdoğan ve Hakkı Karadeniz, *Çocukların çocukları* (2010)

Address any of the 100 most important questions

Abstracts are available separately: £1.00

YORK ELECTRONIC RESEARCH

From: Postmaster@Clemson.edu, 1 Postmaster, Week 2014 Jan

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BE IN ON THE ACTION . . . FROM THE VERY START



COMMODORE DISK USER is a lot more than just another computer magazine. Every issue carries a diskette containing more than £30 worth of software ranging from serious programming utilities to arcade games. There are plenty of Commodore magazines on the market, but we believe that this is the first to cater for disk users of all ages and tastes.

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1984

I.Q.

For those of you who like a brain-straining challenge, then look over our intellectual selection of games.



THE CHESSMASTER 2000

All chess programmes, apart from the fastest playing of the game, offer various features. Different skill levels, 3-D graphics, joystick control or whatever. To date, it has been very much a case of pick the accessories that you like the best. Now your search is over.

The Chessmaster 2000 has the most comprehensive set of features that I have yet witnessed in a single chess program. Indeed, it is difficult to think of anything that has been left out. As well as the eighteen skill levels, plus an indefinite mode, there are special, easy and colloborative modes.

You can choose between 2 and 3-D displays, rotate the board, change the colour of the board, alter your method of inputting moves (algebraic or numeric), set up the board to solve specific problems, take back moves, replay a game, ask for all legal moves to be displayed and even ask for a hint!

Partially played games or games that you wish to study later can be saved to disk. The package also includes a second disk containing 100 classic games ranging from the second world century to the 1882 Karpov - Karpov World Championship.

But these features are really only the icing on the cake. The play's the thing. It is difficult to assess how well a program plays without setting up a series of games against either machine or against a good player.

One of the nice things about a beginner or casual player playing against the computer is that you can set the skill level to be always (or little bit) better than you are.

Having played against most chess programs at some time or other, I felt that Chessmaster was exceeding all over me where other programmes wouldn't have done so. There is no quoted ELO rating for the program but it does boast an opening library of 71,000 moves.

As far as any beginner or non-tournament player is concerned, I would have no hesitation in saying that this was the best chess program currently available both in terms of playing skill and features. And I strongly suspect that all but the very top players would find Chessmaster 2000 a more than useful opponent.

GURU

Touchline

Name: The Chessmaster 2000. **Supplier:** Electronic Arts, Langley Business Centre, 11-15 Station Road, Langley, Aylesbury, Bucks MK15 1JN. Tel: (0753) 49442. **Media:** CD-ROM only. **Price:** £14.95.

Originality: 8/10. **Graphics:** 8/10. **Playability:** 10/10. **Value:** 10/10.

GUILD OF THIEVES

With the release of just one game, The Fens, Magnus Scribble shot straight to the top as Britain's leading adventure house. Their pursuit is unqualified and they brought a quality of graphics to the game that made every other graphic adventure look positively primitive. Even if the story line didn't quaggle at times, the game was head and shoulders better than any thing else written on this side of the Atlantic. The Guild of Thieves is their second release and is

guaranteed to maintain their number-one position.

You are an aspiring burglar, but all crime in *Keravon* is controlled by the Guild, if you want to keep any of your ill-gotten gains, you will need to become a fully paid-up member of the Guild or else risk becoming a permanent fixture at the bottom of the Keravonian equivalent of the M25.

The Guild however does not let any old stiff-stuff join. You have to prove your ability first. Your initiation test comes in the form of a large manuscript just waiting to be burgled. To make sure that you don't try to pull a fast one, the Guildmaster has wired the print and knows exactly what goodies lie around the place.



The game is almost a return to the very first adventure, i.e. a treasure hunt but you are never quite sure what is going to be valuable before you throw anything in the safe. Items placed there cannot be retrieved again.

The storyline, the scroll element in the Pawn, is much improved and the game flows very well with some excellent and original puzzles to be solved.

I have already mentioned the games as being state of the art but Magnus Sorells are never satisfied. One additional touch is that if you have previously examined a location, you can type in 'Kicks you' and providing there are no problems in the way, you will travel to your chosen destination via the most direct route. A boon to people who can't be bothered to draw maps.

The graphics are again excellent and have an impressionist feel to them. You can choose to have either the full picture, a small icon in the top right hand corner of the screen or even no picture at all if you prefer text only games.

Superbly packaged with copies of the latest *White Dwarf* magazine, which includes a coded hint section should you get stuck, *The Guild of Thieves* deserves a place in any adventurer's collection. Highly recommended.

G.R.H.

LEGACY OF ANCHORS

As a poor shepherd living on the planet Tarnation, you have never strayed far from home - you have never worked at all. All that is about to change, when one day you discover a body out in the hills. The dead man is wearing a gold bracelet and carrying a scroll and you feel compelled to take them, even though your first reaction is to run. Curiosity and greed, especially when you see a large building in front of you where none stood before.

The building is a museum and you wonder what looking at the various exhibits. Most of them require a jewelled coin to access their information. You only have two gold coins at present, but that is enough to start you on your adventure.

The geography of Tarnation is large and varied. Towns lie dotted around, but the land between them is treacherous, and monsters lurk everywhere. A few will trade with you but most are after your blood. At least, if you defeat them, you can help yourself to the contents of their lair - usually gold!

As you start, so you have little idea of what your quest entails and so make mistakes worse, you soon have the scroll stolen, and the towns are a good source of power, especially if you have your ferret told. Here you can also buy weapons and armour, food and magic spells. Healers are plentiful but you need to perform a task before they will help you. Schools allow you to improve some of your attributes, for a fee of course. Money is always in short supply but there are places where you try your hand at a couple of gambling games. It's worth banking any profits now as not only do you earn interest, but your money stays put should you receive early death.

There are many smaller quests to complete before you get near your goal. Characters need to be explored and dungeons attacked. You will need to buy boats and bigger and better weapons before eventually employing the services of a winged messenger to fly you to your final confrontation.



Apart from moving your character, the game is entirely menu-driven. The system works well and is very simple to use - no huge list of different commands to learn. The graphics come in two forms. A top down view for when you are in the wilderness, moving on a map and a 3-D view in the dungeons and museums. The dungeons especially are accompanied by some excellent graphics for the monsters.

Conclusion:

Name: *The Guild of Thieves*. Supplier: Kalamit, First Floor, 7 New Oxford Street, London WC1A 1PS. Tel: 01-240 8846. Machines: C64 - disk only. Price: £18.95.

Difficulty: 8/10. Graphics: 8/10. Playability: 8/10. Value: 9/10.

Legions of Ancestors evokes some role-playing games, is very easy to get into. The plot moves in five points you in the right direction as to what you should do next and there is no need for complex note taking. Despite that, it is no pushover and I would estimate some 40-50 hours of gameplay. The ending is also nicely done as your exploits are recorded for posterity as one of the museum displays. Highly recommended to both newcomers and fans of this type of game.

G.R.H.



Teacher:

Name: *Legions of Ancestors*, **Supplier:** *Electronic Arts, Langley Business Centre, 11-19 Station Road, Langley, W. Sussex, Basingstoke 253A, Tel 0714566611. Machines: C64 - disk only. Price: £19.95. Originality: 9/10. Graphics: 8/10. Gameplay: 9/10. Value: 8/10.*

LURKING HORROR

Horror is the name of the game in this latest adventure from Infocom. Written by David Leding, author of *Zork*, *Specter* and *Spellbreaker*, the story takes atmosphere.

You are trying to finish your last assignment, at Fat & Tuck. The terminal room is for once neatly decorated, probably due to the mountains of stone outside and the business of the house. The only other occupants of the room is a somewhat spaced hicken, tirelessly laying into some unidentifiable being.

Logging on, you call your half-completed essay but suddenly the things haven't changed and you find yourself being drawn into another adventure as you are called upon to witness a strange occult ceremony.

Returning to the terminal room, the hicken is most impressed by your efforts, especially if you maintain his daily tin of Chicken Food. He suggests that there might be some sort of mix-up with the Academy department and suggests that you pay them a visit.

Due to the snow, getting there is not as easy as it should be. However, there is another way. Secret passages, prohibited to students, are rumoured to lie below the main

buildings, linking them. It seems that you have no choice but to explore the murky depths. Shifting piles of rubbish with a fork-off trade reveals a trap door. You open it and your nightmare is just about to begin.

This is another typical Infocom game - and that makes excellent. Superbly packaged, an excellent parser (although it's beginning to show its age now) and a story that is clever with atmosphere. *Lurking Horror* is a game that just demands to be played after midnight with all the lights turned out.

G.R.H.

Teacher:

Name: *The Lurking Horror*, **Supplier:** *Electronic Arts, 15 Bond Street, Hampstead, London N19 2PN. Tel: 01-437 1001. Machines: C64 - disk only. Price: £19.95. Originality: 9/10. Graphics: 8/10. Playability: 9/10. Value: 9/10.*

THE PAY OFF

Noun/verb adventure strikes again but who uses complex parsers that much anyway? The Pay Off is a welcome secondly budget offering as a treat for those who still haven't experienced the genre and are daunted by Infocom prices.

Why are you in trouble? You owe the local bookmaker a cool forty thousand given back and all you've got is the world is £50 and a hot tip for the 4/30. How can you pay off Luigi and place your bet in time?

You ask try to play a wheel long but his "bony" object you without ceremony each time. All roads seem to lead to dead ends and if you discover a loophole. This leads you on to discover that a fabulously expensive princess seems due in time. The answer to your problem is about to fall in your lap and all you have to do is track out where, when and how you can steal the stone.

Although the vocabulary in this adventure is limited to about 100 words, the game is not bounded by small-time thinking. Completing your adventure takes quite and a fair bit of clever thinking. How do you track a hidden cat? Shut out an electric knife? Start out a hair curler? From seven to purchase you have to leave no stone unturned if Luigi is to be pleased in time. Good luck and he'll cross you with one of those pretty white marble ones on Fleet Hill.

First-only adventures are making a come back as people realise that a lack of graphics means an excess of complexity within the logic of the game. All there has to be done now is to alert the multiples that the tide is turning and get them to stick the new games.

The Pay Off won't break the bank but it will cost on your brain and follow your logic. But if you'll probably you will leave Luigi!

G.R.H.

Teacher:

Name: *The Pay Off*, **Supplier:** *Big 25, Apple Tree Lodge, Factory House, Leamington Place, London WC2M 7AR. Tel: 01-439 5555. Machines: C64. Price: £29.95. Originality: 7/10. Playability: 7/10. Graphics: 8/10. Value: 7/10.*

Plus/4 and C16 Disk Menu

Find the program you want quickly and easily with this handy menu.

By Jeffrey Hoyle

It can be infuriating trying to find the program you require when you have a lot stored on one disk. This program displays all the program files on the disk presently in the disk drive, and places a corresponding letter or number beside the program name. On selecting a program, pressing the relative key will load and automatically run the chosen program file. If the disk menu program is set as the first program in the directory, then it may be loaded and automatic by pressing SHIFT and RUN/STOP together. The overall result is that the program saves considerable key presses when loading and running programmes from disk.

It should be noted that the program only displays those files on disk, which have the abbreviation "PRO" after the file name, when directed. The other kinds of files cannot be loaded and run, like a program.

Typing In

Type in the program as listed - the R/M statements may be omitted. Before running the program, it is essential that you save it, as it overwrites itself. If there are any errors, then they should be noted and corrected after the program has been

loaded from disk. After the program has been entered correctly and run, there will be a new program sitting at the start of BASIC. When listed, it should read:

10 57584115

The program now has to be saved, as machine code, so it is necessary to go into MONITOR. Type the following:

MONITOR
S'DISK MENU HEADER"R.M01.
1288

From now on, the program may be saved and loaded as a BASIC program, which omits any under complications.

Using the Program

It is best to place the program as the first file on the disk, in which it is to be used. If the disk already has files saved on it, then it is necessary to re-organise the directory, so that a free space is created at the top of the directory. The new program saved to disk, will sit in this place.

The re-organisation may be achieved, by the use of the COPY and SCRATCH commands, e.g. if the first program on disk was called "OLD", then
COPY "OLD" TO "TEMP"

would copy the file "OLD" to a file called "TEMP", elsewhere on the disk. A check should be made, by listing the directory, before:

SCRATCH "OLD"
RENAME "TEMP" TO "OLD"

The result is that "OLD" sits further down the directory, and that a free space at the top, has been created for the disk menu program.

From BASIC, type:
LOAD"DISK MENU HEADER"
after inserting the relative disk, and then replace the disk onto which the program is to be saved. Type in: SAVE "NAME"
where the NAME may be the title of the disk. It is possible to insert the Commodore control and colour codes into the program name string. In the case of the disk menu program, reserve character made could be used, to highlight the disk name.

I have included some poles, which enable you to customise the screen colours, etc.

POKE 4134 with the Commodore character colour code, to alter the ink colour.

POKE 4128 to alter the paper colour.
POKE 4134 to alter the border colour.
POKE 4166 to alter the vertical start position, of the menu.

POKE 4170 to alter the horizontal start position, of the menu.

For example, the default is 0 for the horizontal position of the menu.

Foking with 11, centers the first column and is useful if you decide to

have 16 or less programmes on the disk.

When you are satisfied with the colours of your choice, save to the disk, as instructed before.

The program also loads and runs a machine code program, if it has a SYS command, at the start of BASIC. I have found this extremely useful for auto-running games and utility programmes, and provides a more professional system. Since the program can locate a machine code program, in the correct place in memory, a BASIC program which was initially saved to disk with the high resolution graphics area set aside, will not load at the normal start of BASIC - hence the program will not run or fix. To enable successful loading and auto-running of this program, it will have to be loaded into the computer using DLOAD, and then saved once again.

See Listings on page 122



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Commodore 128 Preferences

Predefine your defaults with this time-saving C128 utility.

by D. Anderson

One of the more useful features provided by some of the WIMP operating systems now being employed on new computers, is the ability to define the default characteristics of your computer, rather than have them dictated to you by the manufacturer. This means that when you turn on your computer, it retrieves a special file from the disk drive which contains all the information necessary to set up the system (e.g. screen colours, cursor type, key repeats etc.). You could do this manually every time, but it is time consuming and will in any event be next to useless as you press RUN/STOP and RESTORE.

Luckily, the Commodore 128 automatically boots the disk drive at switch on, so it has the ability to load and execute a preferences file, but for this to be really useful it is necessary to be able to direct the computer to reset the characteristics of the computer to those in the preferences file every time RUN/STOP and RESTORE are pressed. This means that if a particular program changes, for example the screen colours, you can reset them to your preferred choice simply by hitting RUN/STOP and RESTORE - which is what this program enables you to do.

Furthermore, whilst dealing around with the machine, I have managed to correct two minor, but very irritating bugs, the routine for which is included in the preferences

file, so that they should never rear their ugly head again!

The first is the split screen glitch - if you type GRAPHICS 2,1-RETURN - you will see at the junction of the graphics screen and the text screen an unsightly flickering, which is intensely annoying, and really can spoil what would otherwise be very professional looking programs. The split screen is handled by the editor interrupt routine which has a vector at location \$104. So, by redirecting this vector to the new interrupt routine, I have been able to correct the bug.

Essentially, the problem of split screen glitches occurs because of an oversight by programmers. Now to explain this, I am afraid that I shall have to get a little technical, but bear with me, as I have tried to simplify it as far as possible. Firstly, you must know that a television picture (such as generated by your computer), is generated by firing electrons in a beam at the screen, which causes it to glow - this beam of electrons moves from left to right, generating each line on the screen (raster lines). In order to program a split screen, the pixel line at which the split is to occur is defined, and the computer causes an interrupt to occur when the beam on the television reaches this line.

Once this has occurred, the IRQ routine is entered and the computer has to determine what has caused the interrupt, since there are several

possible causes. Then, when it is sure the interrupt was for the split screen, it can then change the screen mode for the rest of the screen. However, all the time the computer is deciding what caused the interrupt, the television is still drawing the picture, so by the time the screen mode has changed, the electron beam which draws the television picture, is halfway along the line. Furthermore, the computer does not always change the screen mode at the same time, since its timing can not be 100% precise, and so the position at which the split actually occurs oscillates about - hence a glitch is produced.

Delaying Tactics

Now, good programmers take note of this, and build a delay into their program once the split routine has been entered, so that they can be sure that the change will occur within the border, and so any glitch will not be seen. You might well ask why Commodore did not do this, after all they ought to understand their own machines, should they not? Well, after inspecting the split routine, it seems that they have tried to do it.

But what I suspect has gone wrong, is that the UK operating system is the same as the US one, but the US runs at 60 Hz, and the UK at 50 Hz. This means that there is a difference in

timing on the computer between the two countries, which has not been taken into consideration, and hence the delay is not of the correct length to ensure the glitch is pushed into the buffer. Change the length of the delay, and the problem is solved.

The second bug is that in some of the early Commodore 128s that were shipped, the Caps-Lock Key did not work with the letter Q. As a result, when this key was depressed, you had to use the SHIFT key to get a capital Q, which was rather inconvenient, especially if you forget.

The reason for this niggling fault is just one faulty byte in the Kernel ROM. Within the Kernel, there are several tables which define the ASCII code which is to be returned for each key-press - one for normal, Shift, C*, Caps-Lock and the Alt key. Also within the same-page, are sections which point to the start of each of these tables. So all that is necessary to fix this bug is to produce a corrected version of the faulty table and redirect the system towards the new version. This sector, at \$344/\$349, is redirected to the start of the new table.

As I said, there are tables for all the different 'modes' of the keyboard, and they all have vectors. So if you wish, it is quite feasible to redefine the keyboard using the procedure outlined above - just by redirecting the vectors, and replacing the ROM tables. Also, as a result of tinkering with this sector I have noticed that the ALT key can be used to acquire lower case letters whilst the Caps-Lock key is depressed - something not noted by Commodore.

Keeping your Options Open

The program as listed, corrects both of the above mentioned bugs, and also allows you to set the default options, which include:

- 40 column background colour
- 40 column border colour
- 40 column foreground colour
- 40 column cursor flashing, or solid keys to repeat or not
- Type of 80 column cursor-flash, or slow flashing, solid, underlined
- 80 column background colour
- 80 column foreground colour
- Default to upper or lower case

Enable or disable SHIFT/CBM character set change.

The machine code contains checksums, so if you make a mistake typing in the code, you will be informed of it once the program is executed. The routine resides at \$1500, which is destined to become the C128 what \$C000 is to the C64 - a special 'bank' section of memory in which routines can be located without fear of being interfered by BASIC. Once the options have been set, the preference file is saved onto the disk, and you are given the option of setting up the boot sector to load the routine when the machine is switched on. If you wish to do so, you will probably need a blank disk. This is because on a used disk, the special section of the disk used for booting, is quite likely to contain a file. In any case, if you use a used disk and the boot sector is occupied, the program will report this, and not allow you to set it up.

For the cassette users, lines 1118 to 1180 may be omitted. The program can then be loaded and executed at the beginning of every programming session.

See Listings on page 122

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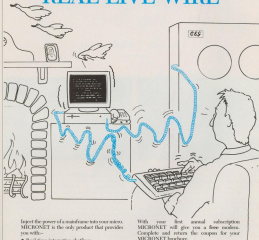
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ICOMM 11/87

The Video Title Shop

A look at one of the latest graphics packages.

By Tony Hetherington



The Video Title Shop is described as a computer and VCR utility which can generate animated introductions to your video tapes. This is obviously useful to those hobbyists who own a video camera, but also applies to anybody who records and keeps anything, as well as being a way to produce animated shop window displays.

The Video Title Shop is supplied on disk and is accompanied by a 48 page manual that takes you through the steps of planning your sequence following the programmer's Command bar prompts, using micropointer plus to draw your backgrounds, adding text in a variety of font sizes and colours and how to link it all together into a sequence complete with scrolling and fade effects. And of course the all important instructions explaining how to connect your computer to your video are also included.

Micro pointer plus is a straight forward graphics package to use complete with solid and editable pattern files, six interesting backdrops can quickly be created for your sequences which are then saved to disk. The Video Title Shop can then use these backdrops as canvases and a base for a sequence.

A typical Video Title Shop sequence consists of four or five pages, a couple of backgrounds and one or two special effects. Each page is actually quite a lot bigger than your computer screen so it's easy to create some text that can be scrolled on to the screen. This text can appear in a variety of font sizes and colours and is typed into an object. If you want to mix text colours and sizes then you need a new

object for each style of text, if not then your entire page of text can be a single object.

Once an object is created it can be moved around the page to get the positioning exactly right.

A single page may be enough to announce that the video tape contains the pictures taken at Fred's third birthday, but for other occasions and advertising demos you'll want a series of pages and you'll want to link them together in an interesting way. The Video Title Shop makes this easy.

The number of pages you can have is only limited by the C64's memory but since the final sequence is to be recorded on video tape you can record the whole sequence in two or three sections (naturally the package will work with both VHS and Betamax videos).

As I mentioned earlier you can scroll text across the screen and you can also set up a timed page that will stay on the screen for any set time between 1/3 second and 15 minutes when the sequence continues. My favourite effect is undoubtedly the fade in which a new page fades over the old one, pixel by pixel until the image is complete.

The Video Title Shop is actually little more than a graphics package with built-in animation (and a few added effects) but it could be just what you've been waiting for.

TH

Teaching:

Title: Video Title Shop. Supplier: C.B. Gold, Cavers J.J. Haydon Way, Haydon, Birmingham B6 7AJ. Machine: C64.

ROM Blow

Feel the burn as Datel's professional DIY cartridge system.

By Eric Doyle

Datel has recently leapfrogged over other utility manufacturers, putting itself in close competition with Erofram Micro. As their product range increases, Datel is refreshing parts of the Commodore system which users could never reach: the cartridge port.

The Datel Eprogrammer's armory is growing daily but the main elements of their cartridge system are the Programmer 64, the Cartridge Development System, the 16K EPROM board and Five Way Serial Expander.

Before assembling a cartridge you need a programmed chip to put into it. EPROMs are identical to the ROMs already inside the C64 in all but one respect, an EPROM can be erased and reprogrammed. Datel's Programmer 64 is tailored to the C64 and provides all you need to transfer your program from memory to chip.

EPROMs have a code number which reveals their memory size. Most codes start with 27 and the next two or three characters reveal their memory size multiplied by eight. For example, a 2K EPROM would have a value of 872 or 16, therefore its code would be 2706, this coding leads to a lot of misloading advertising where 2716 types are referred to as 16K (presumably 16 kilobits), through to 2946 chips which are really only 32K.

Eprogrammer 64 is supplied with its own software which controls the hardware through the user ports. The largest chip which the system can handle is the 27256 (32K) which is equivalent to half of the C64's memory.

Before you start getting too excited about this, let me explain that the maximum space a cartridge system can



access easily is a block of 16K. Furthermore, because the C64 cartridge system is designed to access 8K chips, a 16K chip can only be accessed as two 8K blocks; this means that two 8K programmes can be stored in one cartridge. There is also a dual 64K cartridge but TI come to that later.

Before you can use the Eprogrammer effectively you have to penetrate the mysteries of one of the most documented utilities in computer history. Commodore trust their cartridge system like a trade secret and for most owners it is inner space's answer to a Black Hole, we know things go in but the where, how and

why of what happens next form part of the greatest origins known to man.

Fortunately Datel have untangled the mystery and their 20 page manual lays bare the inner secrets of the cartridge operating system.

What it boils down to is that the system can be tricked into thinking that your cartridge is a normal part of C64 memory occupying locations \$B000-\$BFFF. When the computer powers up, among other things, it does a test to find if the code \$B000 is stored at location \$B004. This is the auto-start key and causes the normal reset routine to abort in favour of the cartridge and a jump is made to a vector pointed to by \$B004-01.

The user program can only run in cartridge space unless a routine is included which will transfer and execute it in normal RAM space.

Obviously, this means a certain number of modifications will have to be made to your program before loading up your EPROM. Data's Epsommer software allows for this by including a monitor as well as the fully comprehensive chip burner.

How Keys

Once prepared, the programming of the chip is child's play. The computer displays a menu and using single key presses the parameters for the same can be set.

First of all the type of EPROM is selected by scanning through all five alternatives from 2716 to 27256. This also alters the display to the most commonly used voltage and speed for the burn. Before proceeding, it's important to check that the voltage is not too high for the chip you're using, otherwise permanent damage will be caused. If the voltage or speed is wrong it can be changed independently by cycling through the alternatives using the relevant key.

My sample EPROM, part of the Cartridge System kit, was rated at about half the voltage automatically suggested by the program. Perhaps it would have been better if Data's halved all the voltages to the low 12.5 volts and let the user increase this as necessary.

There are three programming speeds between 3 and 50ms, this is too fast for some chips. 4ms is more usual and 50ms is only used for older 2716 and 2732 EPROMs.

Normally the program for transfer will be stored in RAM but occasionally you may want to back up a kernel chip. Selecting ROM using the arrow/ key switches in the ROM chip ready for reading.

Today's chips can have such large memories that you may want to program it in 8K blocks. An ALL or RANGE toggle is provided for this purpose. When set to ALL the whole chip will be programmed but on RANGE it depends on which range has been set.

To set a range requires the minimum of thought. All you need to know is where your program starts in memory, its length and where it will



start on the EPROM. Remember that the location of the program in memory at burn time need not bear any relationship to its eventual location in memory at run time, all this is preset under cartridge program control later.

The start and length of the program are easily entered if you know hexadecimal. When Data's programmer has time on his hands he may like to add a decimal/hex calculator to the menu screen.

The EPROM position is very easily worked out. The first program goes on at location 8000 and subsequent programs normally go on at 8K intervals. If it is 8400 bytes, therefore the second program will start at \$2000.

Several DOS commands also appear on the screen: directory, display, disk commands, loading and saving. These are supplemented by a TBC command which pokes a nibble into all memory locations within the limits set as the program range.

The remaining commands are the usually important EPROM commands. Firstly, you can check if the chip is blank. If not you must follow the correct procedure to wipe the memory using ultra-violet radiation for EPROMs or the specially included erase function for EEPROMs.

The next step is to write your program to the chip (burning) and then verify it against the RAM source.

For those doubting Thomas's who want further convincing, you can also read the EPROM into memory again. This comes in useful when you want to back up a commercial EPROM, such

as the program into memory, and blow it out onto your disk.

A la Cart

Now you have your Epsom you can make cartridge production. The Cartridge Development System has a ready to blow 18K EPROM installed in the boards and components (all four of them) necessary to set up your board. A reset switch is already fitted next to a switch to allow the selection of which half of the 18K EPROM you are using. The supplied cartridge casing has two outlets through which the switches will protrude.

Also included in the package is a full 20 page explanation of cartridge theory and assembly. With a minimum of soldering ability, most people will be able to produce professional-looking cartridges.

The other cartridge containing the 18K EPROM board can hold two 27128s which may be switched into memory at \$0000 and \$A000 giving 18K of contiguous RAM (8K from each chip). As with the single chip version the other halves of the two chips can be used to store another 18K program.

The only problems I found with the system were difficulties related to cartridge assembly. Firstly, an experienced programmer may not be very knowledgeable about electronics. To fit a cartridge doesn't require any electrical know-how but it would help if the instructions pointed out the ways to tell which way round a chip should be fitted into the cartridge.

After fitting the chip your problems are not over, the currently fitted DIL sockets which hold the EPROM are too thick. Fitting the two halves of the cartridge together leaves a gap around the edge which, although small, detracts from the professional look of the product.

A final point, concerning the 18K board only, is that the bank switches on the dual chip cartridge are internal. Everyone the user wants to switch from one program to the other, the cartridge has to be unscrewed, opened, switched and then closed.

With the inclusion of two excellent battery backed-up RAM cartridges (Smart Cart) in Data's catalogue, the question must be asked: Why bother with burning when Smart Carts are so cheap?





The cost of a Smart Cart is £14.95 for an 8K pack. For a Cartridge Development System the cost is £12.95 and you have the added expense of £19.99 for theEPROMer 64 unit. The difference being that the System cartridge has two 8K programs and you are free of the worries of battery replacement or failure. If you only intend using two or three cartridges the Smart Cart is good enough. If you can foresee a need for dozens of cartridges and extra Kernal chips then an EPROM system is your only option.

1990-1991 11.500 11.500

Duall also has other interesting products which link in with the Eppromax 84. Take the Five Way Kernel Expander for example. Carefully replace your Kernel ROM with a socket and you can plug this board in and add your ROM. Flanking it on either side is a pair of SR, EPROM sockets which allow you to add four more SR operating systems. Using the supplied switch to select the chips you want, you can power up into an operating system of your own making.

Each month when I see their adverts, Dan's range seems to have grown. The Eppendorf 40, Cartridge Specimen, and Kernal Board are superbly conceived, extremely easy to use and, with MSRP/PRMS costing less than a fiver, the cost of producing your own cartridge compares favourably with that of commercially produced ones. With methafoambs, Supernova boards and cartridges already on Dan's books, I've enjoyed



How much longer you think you can resist EPHEDRA programming.

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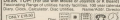
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Table 10 (Cont.) = (Cont.)

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Age Group	Total	Male	Female	Male	Female
18-24	100	100	100	100	100
25-34	100	100	100	100	100
35-44	100	100	100	100	100
45-54	100	100	100	100	100
55-64	100	100	100	100	100
65+	100	100	100	100	100

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1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 26

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62-63. **CONTINUATION** of the preceding record.

Answers are provided at the end of each chapter.

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For example, for those 654 parents who are fed up of having to use those difficult to remember PINKS & POLKES in order to use their wonderful online graphics and sound programmes which are inspired by BANGS & B. High quality, fun, easy to use, and free to use, these programmes have been around nearly 20 years, gaining features and more over the years, and supporting libraries to use them. A national network of providers has also got used to using many more programs to offer CIB access, so that they can train and support teachers. In particular, this means the same core memory and language routines, which means that PINKS & POLKES can be used in schools, produced by any of these programs.

APR 2004 - 04	024.00	024.00	024.00
APR 2004 - 04	024.00	024.00	024.00
APR 2004 - 04	024.00	024.00	024.00
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For this month's competition we have teamed up with Electronic Arts to give you the opportunity of trying your hand piloting a hydrofoil by giving you the chance to win one of 30 copies of Pegasus (see review in this issue) that are up for grabs.

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How to Enter

Study the two cartoons, there are a number of differences between them. Once you have decided how many differences there are complete the entry coupon and send it to the editorial address (see below). Please write the number of differences that you have found on the back of the envelope. If you don't then your entry will not be accepted.

The Rules

Entries will not be accepted from employees of Argus Specialist Publications and Electronic Arts. This restriction also applies to employees' families and agents of the companies.

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Bulletin Boards

Continuing our computer communications series, this month we look at the various uses of bulletin boards.

By Jennifer Goldsmith

Generally speaking, a bulletin board is an electronic noticeboard, which permits two-way communication. This means that the user can obtain information and contribute to the system. It differs from a conferencing system in as much as there are no closed user groups (CUGs) and there are no individual conferences, which are separate entities, with different people organising each conference.

Conferencing systems are usually run by commercial organisations and the subject matter is very diverse. Whereas bulletin boards are usually, but not always, run by the hobbyist and the subject matter is usually specialised in as much as the topics are related to a specific hobby or interest, e.g. PCs, Commodore Computers, Amateur Radio, etc.

How do Bulletin Boards Work?

Basically, there are two different ways in which they work. Either you phone

them and when the modem answers, you connect your modem in the appropriate manner for your software, and then you log on. Or, after you phone the bulletin board, you hang up and the bulletin board's modem phones you back. This latter type of logging on is not so common as it is more expensive to implement, but it does give greater security. If you go to log on to a bulletin board after having used a commercial system like Protel, you may find the bulletin board unfriendly.

Exactly what is required differs from system to system but you will find that often your name is required followed by a carriage return or hash. Next, you, divulge your Protel ID or password, or any password on any other system (unless everything is free and you have nothing to loose by doing so).

Some bulletin boards, especially those whose software originated in the USA, operate at 300/300 baud scrolling. However, with the growth in

popularity in the UK of videodata systems, some software has been written for bulletin boards using this format, i.e. colour and 1200/75 baud. Therefore as mentioned in the October issue, you have to make sure that you have the appropriate software and that the modem and software are compatible.

Growing in Popularity

One of the reasons why bulletin boards have become popular, is that anyone can set them up. For example, a C64 with disk drive, autonomous modem and bulletin board software for the 64 costing £89, which is available from T2 Computing, is all you need.

However, many of the popular boards have a hard disk attached. This allows an increase in speed of operation and allows much more material to be available to the user. For example, with a 1541, only a couple of hundred or so frames (think of videodata compatible boards

could be stored, but with a hard disk, thousands of frames could be stored and/or much telepresence as well. Therefore, bulletin boards are not only expensive to set up but they are also hard work.

For this reason, you will find that access to some bulletin boards is restricted to certain hours only, yet others are available 24 hours. No-one can give you hard and fast rules when it comes to bulletin boards as there are about 200 in the UK, thousands in the USA, and the number is on the increase.

You may have difficulty in accessing popular boards, as many people are trying simultaneously and there is usually only one phone line, which means of course that only one person can use the system at any given time. You must bear this in mind when you're using a bulletin board, so that you minimise the time you are on-line in order to let others use the system.

Listings of Bulletin Boards

It would be very difficult and impractical for me to provide a complete listing of bulletin boards in the UK. There are various sources for lists. Firstly the Bulletin Boards Operators Association, which is an association to which systems operators (sysops) can belong. This information is also supplied to Clublog on Protocol. However, these sources of lists are not currently available as unfortunately they were destroyed in a fire, and are in the process of being re-compiled at the moment.

The other source of lists is the magazine *Telelink*, which comes out six times a year. It is a magazine wholly devoted to communications in the UK and at £15 for two year subscriptions, it is a MUST. Just contact Database Publications on Protocol (Mfrs 61446618) or on Telocom Gold 7256AC6601 and credit cards are an acceptable means of payment.

Finding Your Way About

There is no easy way of knowing what bulletin boards have what information. Either you get information from your friends and colleagues or you just phone around. Anyway to get you going, here is a brief description of some of them.

However, I can take no responsibility for any errors or omissions.

The first one I would like to mention is a fairly new board, based in Wolverhampton, telephone number 0902 745210. (It may be on PMS but I am not sure.) What is unique, is that (to my knowledge) it is entirely devoted to Commodore users, covering all machines including the Amiga. There is an increasing amount of software. It is available 24 hours on both 360/300 and 1200/75 scrolling.

The next bulletin board is devoted purely to a hobby. In this case it is Amateur Radio. The Radio Society of Great Britain run a bulletin board (tel. 0767 52542) which is available 24 hours on 1200/75 half doublets format. Normally only one phone line is available but I believe it is hoped that two lines will be in use before long.

This bulletin board has a fairly large database on various aspects of amateur radio, including band plans, a diary of events, rallies and contests, information on Morse tests and the radio amateurs examination (incl. news from both home and abroad, packet radio, solar propagation, club information and news, RAYNET, repeaters and beacons, books and other products which can be purchased from RSGB, RSGB articles, satellite and information for beginners.

In addition to this, there are response frames for ordering books, etc, by credit cards, for obtaining information and you can write your own messages as well. Unlike most boards, it is updated most working days as a full-time editor/database manager is employed.

The Gemini at Home is a very popular board which supports six phone lines 24 hours a day. Two of these phone lines are for the general public, the other four are kept for the paying subscribers. Subscription is very cheap and only costs £1.50 a month which is well worth while, just to be able to access the board more readily. The two lines for the public are on 01-488 6864 at 1200/75 baud, using viewdata compatible software.

The London Underground bulletin Board is available 24 hours on 01-463 9199 on 300/300, 1200/75 and 1200 full duplex and has about 4000 callers a year. This is quite good, but I believe RSGB has between 14-17 callers a day. However, this bulletin board runs on a

PC whereas RSGB's database uses a BBC. Both make use of a hard disk as does the Commodore one which also uses a PC clone.

There are two BABS boards. BABS stands for British Apple Bulletin Board System. They run at 300 baud, are sponsored by BANYX, British Apple System User Group and are available 24 hours a day on 0394 256586 and 0268 778996.

Robert O'Donnell's bulletin board in Manchester was the first bulletin board to use a BBC micro and colour. Robert has worked for a few computer companies and has even written his own communication software. His board covers more interests, something for everyone - adventure, BBC software, jokes and advertisements. No wonder Microsoft are currently employing him! Rob's board is available 24 hours at 300 baud on 061-427 1996.

Lynn Hard, who is the sysop for the Community Hope bulletin board in Poncy, Wales was most probably the first female sysop in the UK. There are currently only about three of four female sysops on the UK (in over 200 boards!).

One important point is that in order to access the board you do NOT have to be using the same computer as the one which is running the board. For example, a BBC may be running the RSGB board but any computer which has viewdata compatible software using 1200/75 will be able to access it.

Accessing Boards in America

The bulletin board industry in America is, unlike its British counterpart, very organised. Most States operate on what is known as Bell frequencies. The UK (EXT) tones do not work in the USA (and Canada). Therefore your modem will have to be able to cope with the Bell frequencies. The bell frequencies, in Hertz, are: Bell 103 (300 baud) is Originate transmit 1030 40 (177 Hz) receive 2025 40 (2225 Hz) Bell 300 (1200 baud) transmit and receive 2000Hz (1200 Hz).

This is half-duplex and is the same as our 1200 half-duplex. However the 300 baud is not the same as the British 300 baud.

Once you have overcome the problem of the Bell tones, your next problem will be the logging on. As

when you log on, most systems will ask you your telephone number. In America there are always 10 digits in the format XXX-XXX-XXXX. This is fine if your phone number is 081-123-4567 but if you live in London instead of quoting your phone number as 08-123-4567 you will need to add an additional zero before the 81.

Once you have logged on, do not get upset if the system seems a little slow, just remember that it is most probably supporting more than one phone line (therefore you would not have got one!) and also that all systems are volunteers and under no obligation to provide a service.

In the USA, there are something like 4,000 or so bulletin boards, so again a complete listing is impossible, but here are a few for you to be getting on with.

Chicago (CPM) (area) 011-444-66-
66 66 66 66 66

*California (Did Your match) 0101-
399-399, 1125 R-11 1991

Los Angeles (Consumer news) 0101-
1044/4444 Post 1001/1001

1000

CompuNet is the first commercial network service in the UK, to operate along bulletin board lines. The service now has several thousands of Commodore 64 users and improved software and thirty ports to cope with them. Unlike most bulletin boards, you can actually buy goods and have them charged to your account, which is a necessary aid to direct debit.

There is a wide variety of software to include everything from printer and communications utilities to 128 software and even items for the Amiga. ICPUG, the Independent Commodore Products Users Group has a large database with something for everyone, from hints and tips on using databases, to news and software.

Other clubs include ICC, the independent Computer Club, Club 128 for 128 users and special interest sections including ChessNet for chess enthusiasts and amateur radio and other communications sections. Its members list is long.

CompuNet works on IBM/PS/2 based and you have to use its unique software which will only work with the CIM/Modem. The first time you log on to CompuNet, after registering and obtaining your password, you will see the message LINKING. When you quit the system, you must save the software, to avoid having to LINK again, by doing a **CNSAVE**. When you next go to log on to the system, you will see in the command, **CNLOAD**, the software will load from your disk, you then type **CONNECT**, **HI RETURN** and the software, which will have stored the phone number, will autodial for you. You will be able to see where you are connecting to CompuNet in the colour of the screen changes from blue to violet.

CompuNet like many bulletin boards has an area in which you can load your own material. On CompuNet this area is called the Jungle. Yes, you can even sell your own programmes on CompuNet providing you're willing to let CompuNet take some of the money as commission! Harvey Handford

U.S. Soft Centre:

[illegible]

	Price
Intel Pentium III Computer	\$799.00
Processor	\$199.00
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Hard Drive (Storage) (Internal disk drive)	\$199.00
Power Supply Unit (PSU)	\$199.00
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Case (Chassis)	\$199.00
Operating System (OS)	\$199.00
Software (Applications)	\$199.00
Peripherals (Mouse, Keyboard, Monitor)	\$199.00
Total Price	\$1,999.00

BANK OF AMERICA			
	12/31/01	12/31/00	12/31/99
Assets	100.00	100.00	100.00
Liabilities	100.00	100.00	100.00
Equity	100.00	100.00	100.00
Assets	100.00	100.00	100.00
Liabilities	100.00	100.00	100.00
Equity	100.00	100.00	100.00
Assets	100.00	100.00	100.00
Liabilities	100.00	100.00	100.00
Equity	100.00	100.00	100.00

Category	Value
Operating Income	1,200
Operating Expenses	1,000
Operating Profit	200
Interest Expense	100
Income Before Taxes	100
Taxes	20
Net Income	80

[illegible]

	1999	2000
Value of Sales	1,000	1,000
Cost of Sales	600	600
Gross Profit	400	400
Operating Expenses	100	100
Operating Profit	300	300
Interest Expense (10%)	100	100
Income Before Taxes	200	200
Taxes (30%)	60	60
Net Income	140	140
Dividends (50%)	70	70
Retained Earnings	70	70

[illegible]

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 program that simulates the
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FOR MORE INFO
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[illegible]

Account	12/31/00	12/31/01	12/31/02
Accounts receivable	100.00	100.00	100.00
Inventory	100.00	100.00	100.00
Prepaid expenses	100.00	100.00	100.00
Property, plant, and equipment	100.00	100.00	100.00
Intangible assets	100.00	100.00	100.00
Goodwill	100.00	100.00	100.00
Other assets	100.00	100.00	100.00
Accounts payable	100.00	100.00	100.00
Accrued liabilities	100.00	100.00	100.00
Deferred tax liabilities	100.00	100.00	100.00
Other liabilities	100.00	100.00	100.00
Equity	100.00	100.00	100.00
Retained earnings	100.00	100.00	100.00
Other equity	100.00	100.00	100.00
Total	100.00	100.00	100.00

Account	Debit	Credit
Accounts receivable	100.00	
Accounts payable		100.00
Inventory	100.00	
Equity		100.00
Cost of goods sold	100.00	
Income tax expense	100.00	
Income tax payable		100.00
Retained earnings		100.00

	1999	2000
Revenue	10,000	10,000
Cost of Sales	10,000	10,000
Gross Profit	0	0
Operating Expenses	10,000	10,000
Operating Income	0	0
Income Taxes	0	0
Net Income	0	0

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■ Amiga 4000	

Number Tumble

A frustrating game for two players.

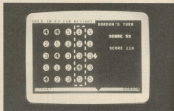
By John Phillips

The basic idea of the game is that a 5x5 grid of numbers between one and five is presented. Player one can move a column one place up or down (with a wraparound effect) to produce either a winning sequence of 1,2,3,4,5 reading up, down, left or right, or to produce scoring sequences of 2,3,4 or 5 identical numbers in a line (up or down). Player two (or C84 if in one player mode) then has to move a row one place backwards or forwards with the same aim.

The winner is the first to produce either a 1,2,3,4,5 sequence or the first to create a large differential in points which will remove the opponents bar marker from the bottom of the screen. Both methods result in a 100 points bonus.

To add to the fun, after all 1, 4 and 5 number scoring sequences, at least two of the numbers are changed by one count in either direction. There are not random changes but they are explained more fully in the program.

In 1 player mode, a pre-selected level of 1 to 5 gives the computer 30% to 100% chance of achieving the highest obtainable score for its turn, but will always detect a 1,2,3,4,5 sequence if one is available. The higher the level, the longer the time the computer needs to respond, but this is indicated on screen via a countdown timer.



Other than the random selection of the initial grid the game is totally logical and requires no real thought. Games may last a couple of minutes to half an hour or more, depending on intellect between players or the level selected.

Getting it in

The program is presented in two parts; the first contains all the data for win/sequences and U.D.C.s and also for copying character sets. The DATA LOADER must be typed and saved

before the Number Tumble program.

A small normalising program has also been given because if RUN/STOP and RESTORE buttons are used after running the main program the screen blanks and no typing can be seen. This is due to the banks, screens and characters having been shifted around.

Type RUN 16000 (even though you can't see it) and the computer will return to normal after RETURN has been pressed. This add-on program proved useful during development of the game and may similarly help while de-bugging takes place. □

See Listings on page 111



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1000

Country	Year	Value	Unit	Source
Algeria	1980	1000	kg	FAO
Algeria	1981	1000	kg	FAO
Algeria	1982	1000	kg	FAO
Algeria	1983	1000	kg	FAO
Algeria	1984	1000	kg	FAO
Algeria	1985	1000	kg	FAO
Algeria	1986	1000	kg	FAO
Algeria	1987	1000	kg	FAO
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Parameter	Value	Unit
Initial temperature	25	°C
Final temperature	100	°C
Heating rate	10	°C/min
Modulation amplitude	0.5	°C
Modulation period	32	s
Modulation frequency	0.03125	Hz
Modulation phase	0	°
Modulation type	Temperature	
Modulation direction	Up	
Modulation speed	10	°C/min
Modulation acceleration	10	°C/min ²
Modulation deceleration	10	°C/min ²
Modulation dwell time	10	s
Modulation dwell temperature	100	°C
Modulation dwell time at 100°C	10	s
Modulation dwell time at 150°C	10	s
Modulation dwell time at 200°C	10	s
Modulation dwell time at 250°C	10	s
Modulation dwell time at 300°C	10	s
Modulation dwell time at 350°C	10	s
Modulation dwell time at 400°C	10	s
Modulation dwell time at 450°C	10	s
Modulation dwell time at 500°C	10	s
Modulation dwell time at 550°C	10	s
Modulation dwell time at 600°C	10	s
Modulation dwell time at 650°C	10	s
Modulation dwell time at 700°C	10	s
Modulation dwell time at 750°C	10	s
Modulation dwell time at 800°C	10	s
Modulation dwell time at 850°C	10	s
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Modulation dwell time at 1100°C	10	s
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Modulation dwell time at 4750°C	10	s
Modulation dwell time at 4800°C	10	s

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Average 1000 ft. Soil Temperature	50.0
Range 1000 ft. Soil Temperature	48.0 - 52.0
Average 1000 ft. Soil Moisture	1.0
Range 1000 ft. Soil Moisture	0.5 - 1.5

[illegible][illegible]

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Abstract

<p> RENTAL FOR MONTH END 07/01 12.00 RENTAL CHARGE FOR 07/01 12.00 </p>	<p> 07/01 12.00 </p>
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Page 2, Sentence 4

— 1944 —

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0-44

1. General - provide your address, date, and appropriate title and name of person to whom you are submitting the letter. If you are submitting the letter to a group, provide the name of the group and the name of the person to whom the letter should be sent.

[illegible]

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The Four Commodore Software Service makes available all of the programmes from each issue on both cassette and disk at a price of £8.00 for disk and £4.00 for cassette. None of the documentation for the programmes is supplied with the software since it is all available in the relevant magazine. Should you not have the magazine then back issues are available from the following address:

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Programmes on the disk will also be supplied as totally working versions, i.e. when possible we will not use Basic Loaders thus making use of the programmes much easier. Unfortunately at the moment we cannot duplicate C18 and Plus/4 cassettes. However programmes for these machines will be available on the disk.

What programmes are available?

At the top of each article you will find a strap containing the article type, C64 Program etc. So that you can see which programmes are available on which format you will also find a couple of symbols after this strap. The symbols have the following meaning:



This symbol means that the program is available on cassette.



These programs are available on disk.

Please Note

Since the programs supplied on cassette are total working versions of the program, we do not put disk-only programmes on tape. There is no sense in placing a program that expects to be reading from disk on to tape.

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DUAL PROGRAMMING - Have two programmes in your Plus/4's memory at once. (On disk only.)

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Communications Corner

David Janda is back with more news and views from the communications world.

IN AN UNEXPECTED move, major tariff changes for the Telecom Gold system were made in early August. The good news is that the peak rate time charge is now 6.5p per minute, down from 11p, and that the off-peak rate is now 2p, down from 3.5p. The bad news is that Telecom Gold has imposed a £5 per month subscription fee on every mailbox.

But by far the most controversial change is a new tariff for data transfer. Each block of 512 characters sent to or from Telecom Gold will cost the user 4p at peak time and 1p off-peak - with the first 512 characters free. This means that a 1000 word document will on average cost 48p at peak time or 12p off-peak to read or send.

The new tariff structure will affect all users across the board, especially domestic users as they will not be able to offset the cost of using Telecom Gold as a company expense. Further, domestic users tend to make extensive use of areas on Gold that rely on sending/receiving text such as Email, news areas, and on system 71 which is operated by Interlink - the bulletin board facility.

Almost overnight, the new pricing structure has changed Telecom Gold from being one of the most cost-effective databases, to one of the most expensive. For example, a user wishing to facilitate one of the on-line information services such as FinTech

will have to pay the information provider a time charge for accessing the database as well as the connect charge and the data transfer charge imposed by Telecom Gold. Worse still, users accessing Gold via PPS also have to pay a data transfer charge on top of that. Add to all this the cost of the phone call to your local PPS node/Gold port and the cost begins to add up!

Microsoft Goes for Gold

However, there is a way to avoid the £5 subscription fee and the cost of long distance phone calls, and yet still have access to all the facilities of Telecom Gold - by simply joining Microsoft.

Interlink is the name of a 'gateway' that enables Microsoft subscribers to be connected through to Telecom Gold. From within Microsoft, the user goes to the Interlink front page (**401 999999) or *INTERLINK, and presses '1' to make the connection. Once this is done, the user logs on by calling system 74, enters their ID and password, and is through to Telecom Gold, some clever software converts Gold's 80 column format to 40 column that's required by Protext. At the end of each frame the user is prompted to press RETURN; the screen will then clear and more text, if any, will follow.

To use Interlink, Microsoft subscribers must first register online. Once done, you will be provided with your own Telecom Gold mailbox which you can access through Interlink, or by accessing Telecom Gold directly; there is no registration fee and Interlink members do not have to pay the £5 subscription fee each month. There is a charge of 1p per minute for using the gateway, but when you take into account local call access for Protext/Microsoft subscribers and the saving of the £5 subscription fee, accessing Telecom Gold via Interlink is very cost effective. Consider the following subscription charges for a period of one year:

Telecom Gold:	£80
Protext:	£25
Microsoft/Protext:	£66

Subscribing to Telecom Gold and Protext will cost £86 per year, yet subscribing to Microsoft (which also means subscribing to Protext as Microsoft is an information provider on the Protext database) will get you all these services for £66 - and that is exceptional value for money.

According to Microsoft's PR manager, David Rosenbaum, Protext are currently developing on an 80 column gateway which can be used with Protext/Microsoft, and the Microsoft have made 'a mega

development in online chat facilities." Full details on both items next month.

CompuNet Changes

SEVERAL MAJOR CHANGES have happened at CompuNet over the last few months. First, CompuNet has 'moved' the whole database onto their new 'mainframe' computer. Previously, the service was run on a DEC 10 mainframe computer which was a timesharing system. The result was slow login time, slow page access, slow everything. However, with their new mainframe, which consists of a series of 68010 microprocessors, things should be speeded up. New applications software has been written in C, and single processors are allocated to individual tasks such as updating the directory.

There should be several benefits to the subscriber as a result of the move. Firstly speed - the time taken to move through the database should be improved dramatically. Capacity will be doubled, allowing more people to

subscribe. Facilities such as the multi-user game (MUG) Federation is now available and may soon be followed by GoGo. Including MUG, this would bring the number of MUGs to three on the system. CompuNet also intend to cater for micros other than the C64/C128 in the near future. The MRC micro was to have been the first of these micros, but the plan to accommodate the Beeb was abandoned earlier this year.

Finally, the cost of using CompuNet has gone down - well, sort of. Previously, a subscriber could access CompuNet by calling one of several numbers that were scattered around the country. These 'free' numbers have been scrapped and everyone must access the service through the local network. Local prices have gone down to 1p per minute, and the cost of accessing CompuNet during peak hours has gone down to 60p per hour for London users and 84 for all other users.

Gold subscribers can take out a quarterly subscription of £3.49 (inc

VAT) to cover off peak connect charges.

Obviously the price reductions are a move in the right direction. But what seems unfair is the removal of the free phone numbers.

Snapple

The cost of accessing CompuNet in the evening requires a local phone call to an local port during the off-peak period and the local charge: the total is £1.04 per hour (ex VAT on the phone call). Accessing Micronet in the evening requires a local call to a Prestel port in the off-peak period: this costs 40p per hour (ex VAT). There is no charge for using the Prestel network.

Facilities

Telecom Gold: 01-403 6777.
Micronet: 01-378 8184.
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Adventure Kit II

Continuing our adventure writing series, this month we look at everything you need to know about the text.

By Allen Webb

This month I will deal with the text, the life-blood of adventures. Since text is RAM hungry, this section will utilize the unused RAM lurking behind the ROMs. The actual code is quite small but it needs four tables occupying 1K. In order to print text, we need to know two things. First we need the start address of the text and secondly some way of knowing when the text ends.

In this case, I will use a zero byte as a sentinel to mark the end of each piece of text. Since only simple indexed addressing is used, each block of text is limited to 256 bytes. The actual text is stored in an uncompressed form to allow you the full use of characters and control codes. If you want to use compressed storage, refer to my article in *Your Commodore* (September 1987) which covers it.

How the Code works

Below I describe the editor for this section. I will give some detail on how the code works, for those of you who want to write their own editor. The syntax for the code is:

`SYN 51968,BANK,MESSAGE
NO,LINE`

BANK refers to the block of RAM concerned and has the values:
0 = area below the BASIC ROM

between 4096 (5A000) and 49151 (80FFF)

1 = area below the Kernal ROM between 5F544 (BF000) and 65535 (FFFFF)

This gives a total of about 16K for text.

MESSAGE NO is self-explanatory and has the value between 0 and 255. The editor initialises the table values to zero. If you try to edit a non-existent message the zero bytes are detected and you get a flashing border to warn you of your error. This action does not, however, terminate execution of your BASIC program.

LINE refers the starting line for the message. The normal scrolling as occurs with PRINT will be avoided.

The memory used by the code is as follows:

`8CB00-8CBFF`.....main code
`8CC00-8CCFF`.....low byte table for BASIC ROM area

`8CD00-8CDFF`.....main code
`8CC00-8CCFF`.....low byte table for BASIC ROM area

`8CD00-8CDFF`.....high byte table for BASIC ROM area

`8CE00-8CEFF`.....low byte table for KERNAL ROM area

`8CF00-8CFFF`.....high byte table for KERNAL ROM area

The start addresses of each message are kept in the above tables. For example, the low byte (L-B) of the start address of message 1 under the BASIC ROM is held in location 8CC00 (32E25). Similarly, the high byte (H-B) is in 8CD00. The start address of the message is then given by:

$\text{Address} = \text{HB} \times 256 + \text{LB}$

The editor given seems rather disproportionately large for the code it serves, but my reasons for using mostly machine code are simple. Any text editor written in BASIC will be sluggish and the other operations involved will give an unwieldy program. The main editor is called by a short jump of BASIC. It is driven by a main menu screen which also gives help and shows the current memory usage in each bank.

The two memory banks are handled separately and you can only work on one at a time. You can toggle between them by pressing F1, and the border colour will change accordingly. This option is selected from the main menu only. Subsequent actions such as initialization and text entry act on the current bank.



Listings

*Get it right first time with our deluxe program system
for the C64.*

You may have noticed that our listings are free of those horrible little black blobs which send you searching around the keyboard for a suitable graphic symbol. You may also have noticed the funny numbers by the side of each line of the listing. First no more, it's all part of our easy entry aid.

Instead of those nasty graphics and rows of countless spaces in PRINT statements and strings we use a special coding system. The code, or mnemonic, is always contained in square brackets and you'll soon learn to decipher their meanings.

For example, [SA] would mean type in a Shifted A, or an acre of spaces in layman's terms, and [SAH] would mean a row of ten of these symbols.

[S+2] means hold down the shift key and press the plus key twice. It doesn't take a great leap of logic to realise that [C+2] means exactly the same thing except that the Commodore key (bottom left of the keyboard) is held down instead of the shift key.

If more than two spaces appear in a statement then this will be printed as [SPC4] or, exceptionally, [SPCn]. Translated into English this means press the spacebar four times or in the latter case hold the shift key down while you do it.

A string of special characters could appear as:

[CTRL N, DOWN2LEFTS,BLUE, F3,C9]

This would be achieved by holding

down the CTRL key as you press N, press the cursor key down twice, the cursor left key five times, press the key marked BLUE while holding down the CTRL key, press the F3 key and, finally hold the Commodore key down while passing the number two key (C2) would of course make the computer print in brown.

Always remember that you should only have a row of graphics characters on your screen with no square brackets and no commas, unless something like this appears:

[88][C+]

In this case the two characters should have a comma between them.

On rare occasions [REV T] will appear in a listing. This is a delete symbol and is created by entering the line up to this mnemonic. Then type a closing quotation mark (SHIFT + 2) and delete it. This gets the computer out of quotes mode. Hold down CTRL and press the number nine key (EVSOM), type the relevant number of reversed T's and then hold down CTRL and press zero (EVSOPF). Next type another quotation mark and delete it again. Now finish the line and press RETURN.

A list of these special cases is given in the table but remember that only one of these mnemonics will appear outside of a PRINT string the symbol for pi. This may appear when its value is needed in a calculation so this may look something like:

CC=2*[PI]*R;

Ignore the square brackets and just type in a shifted upward pointing arrow (ie. the pi symbol).

PROGRAMS LISTED ON DISC

5. NEW SYSTEM DEMONSTRATION - ERIC DOYLE

```
10 BL=0:0 100-70 100-10000
20 FOR I=0 TO 10:DO=DO+I+1:DO=DO+1
30 READ A:IF A=0 THEN PRINT "END"
40 DO=DO+1:IF DO=0 THEN DO=10000
50 DO=DO+1:IF DO=0 THEN DO=10000
60 DO=DO+1:IF DO=0 THEN DO=10000
70 DO=DO+1:IF DO=0 THEN DO=10000
80 DO=DO+1:IF DO=0 THEN DO=10000
90 DO=DO+1:IF DO=0 THEN DO=10000
100 DO=DO+1:IF DO=0 THEN DO=10000
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400 DO=DO+1:IF DO=0 THEN DO=10000
410 DO=DO+1:IF DO=0 THEN DO=10000
420 DO=DO+1:IF DO=0 THEN DO=10000
430 DO=DO+1:IF DO=0 THEN DO=10000
440 DO=DO+1:IF DO=0 THEN DO=10000
450 DO=DO+1:IF DO=0 THEN DO=10000
460 DO=DO+1:IF DO=0 THEN DO=10000
470 DO=DO+1:IF DO=0 THEN DO=10000
480 DO=DO+1:IF DO=0 THEN DO=10000
490 DO=DO+1:IF DO=0 THEN DO=10000
500 DO=DO+1:IF DO=0 THEN DO=10000
510 DO=DO+1:IF DO=0 THEN DO=10000
520 DO=DO+1:IF DO=0 THEN DO=10000
530 DO=DO+1:IF DO=0 THEN DO=10000
540 DO=DO+1:IF DO=0 THEN DO=10000
550 DO=DO+1:IF DO=0 THEN DO=10000
560 DO=DO+1:IF DO=0 THEN DO=10000
570 DO=DO+1:IF DO=0 THEN DO=10000
580 DO=DO+1:IF DO=0 THEN DO=10000
590 DO=DO+1:IF DO=0 THEN DO=10000
600 DO=DO+1:IF DO=0 THEN DO=10000
610 DO=DO+1:IF DO=0 THEN DO=10000
620 DO=DO+1:IF DO=0 THEN DO=10000
630 DO=DO+1:IF DO=0 THEN DO=10000
640 DO=DO+1:IF DO=0 THEN DO=10000
650 DO=DO+1:IF DO=0 THEN DO=10000
660 DO=DO+1:IF DO=0 THEN DO=10000
670 DO=DO+1:IF DO=0 THEN DO=10000
680 DO=DO+1:IF DO=0 THEN DO=10000
690 DO=DO+1:IF DO=0 THEN DO=10000
700 DO=DO+1:IF DO=0 THEN DO=10000
710 DO=DO+1:IF DO=0 THEN DO=10000
720 DO=DO+1:IF DO=0 THEN DO=10000
730 DO=DO+1:IF DO=0 THEN DO=10000
740 DO=DO+1:IF DO=0 THEN DO=10000
750 DO=DO+1:IF DO=0 THEN DO=10000
760 DO=DO+1:IF DO=0 THEN DO=10000
770 DO=DO+1:IF DO=0 THEN DO=10000
780 DO=DO+1:IF DO=0 THEN DO=10000
790 DO=DO+1:IF DO=0 THEN DO=10000
800 DO=DO+1:IF DO=0 THEN DO=10000
810 DO=DO+1:IF DO=0 THEN DO=10000
820 DO=DO+1:IF DO=0 THEN DO=10000
830 DO=DO+1:IF DO=0 THEN DO=10000
840 DO=DO+1:IF DO=0 THEN DO=10000
850 DO=DO+1:IF DO=0 THEN DO=10000
860 DO=DO+1:IF DO=0 THEN DO=10000
870 DO=DO+1:IF DO=0 THEN DO=10000
880 DO=DO+1:IF DO=0 THEN DO=10000
890 DO=DO+1:IF DO=0 THEN DO=10000
900 DO=DO+1:IF DO=0 THEN DO=10000
910 DO=DO+1:IF DO=0 THEN DO=10000
920 DO=DO+1:IF DO=0 THEN DO=10000
930 DO=DO+1:IF DO=0 THEN DO=10000
940 DO=DO+1:IF DO=0 THEN DO=10000
950 DO=DO+1:IF DO=0 THEN DO=10000
960 DO=DO+1:IF DO=0 THEN DO=10000
970 DO=DO+1:IF DO=0 THEN DO=10000
980 DO=DO+1:IF DO=0 THEN DO=10000
990 DO=DO+1:IF DO=0 THEN DO=10000
1000 DO=DO+1:IF DO=0 THEN DO=10000
```

by Eric Doyle



Checksum Program

The hexadecimal numbers appearing in a column to the left of the listing should not be typed in with the program. These are merely checksum values and are there to help you get each line right. Don't worry if you don't understand the hexadecimal system, as long as you can compare two characters on the screen with the corresponding two characters in the magazine you can use our line checking program.

Type in the Checksum Program, make sure that you've not made any mistakes and save it to tape or disk

immediately because it will be used with most of the present and future listings appearing in *Your Commodore*.

At the start of each programming session, load Checksum and run it. The screen will turn brown with yellow characters and each time you type in a line and press the RETURN key a number will appear on the screen in white. This should be the same as the corresponding value in the magazine.

If the two values don't relate to one another, you have not copied the line exactly as printed so go back and check each character carefully. When you find the error simply correct it and

press RETURN again.

If you want to turn off the checker simply type 81549152 and the screen will return to the default color values. You can then do whatever it was you wanted to do and if this doesn't use the area where Checksum lies you can go back to it with the same 815 command.

Lower Case

Many of the listings are presented in lower case. To turn your computer to lower case mode press the Commodore key and the SHIFT key at the same time.

TS

Mnemonic Symbol Keypress

[RIGHT]		CSR left/right
[LEFT]		SHIFT & CSR left/right
[DOWN]		CSR up/down
[UP]		SHIFT & CSR up/down
[F1]		F1 key
[F2]		SHIFT & F1 key
[F3]		F3 key
[F4]		SHIFT & F3 key
[F5]		F5 key
[F6]		SHIFT & F5 key
[F7]		F7 key
[F8]		SHIFT & F7 key
[HOME]		CLR/HOME
[CLR]		SHIFT & CLR/HOME
[RVSON]		CTRL & 5
[RVSOFF]		CTRL & 6

Mnemonic Symbol Keypress

[BLACK]		CTRL & 1
[WHITE]		CTRL & 2
[RED]		CTRL & 3
[CYAN]		CTRL & 4
[PURPLE]		CTRL & 5
[GREEN]		CTRL & 6
[BLUE]		CTRL & 7
[YELLOW]		CTRL & 8
[POUND]		#
[LBARROW]		←
[UPARROW]		↑
[PI]		SHIFT & ↑
[INST]		SHIFT & INST/DEL
[REV T]		no text
[Clear]		CRM + letter
[Store]		SHIFT + letter

LISTINGS

DISKET 8

Please refer to Listings before
typing in any programs.

PROGRAM: MEN CLEAR BOUT

READY.

```

45 15 01=30000 00=00000 00=0
46 16 01=00000 00=00000 00=0
47 17 00=00000 01=00000 02=0
48 18 01=00000
49 19 01=00000 00=00000 01=0
50 20 01=00000 00=00000 01=0
51 21 01=00000 00=00000 01=0
52 22 01=00000 00=00000 01=0
53 23 01=00000 00=00000 01=0
54 24 01=00000 00=00000 01=0
55 25 01=00000 00=00000 01=0
56 26 01=00000 00=00000 01=0
57 27 01=00000 00=00000 01=0
58 28 01=00000 00=00000 01=0
59 29 01=00000 00=00000 01=0
60 30 01=00000 00=00000 01=0
61 31 01=00000 00=00000 01=0
62 32 01=00000 00=00000 01=0
63 33 01=00000 00=00000 01=0
64 34 01=00000 00=00000 01=0
65 35 01=00000 00=00000 01=0
66 36 01=00000 00=00000 01=0
67 37 01=00000 00=00000 01=0
68 38 01=00000 00=00000 01=0
69 39 01=00000 00=00000 01=0
70 40 01=00000 00=00000 01=0
71 41 01=00000 00=00000 01=0
72 42 01=00000 00=00000 01=0
73 43 01=00000 00=00000 01=0
74 44 01=00000 00=00000 01=0
75 45 01=00000 00=00000 01=0
76 46 01=00000 00=00000 01=0
77 47 01=00000 00=00000 01=0
78 48 01=00000 00=00000 01=0
79 49 01=00000 00=00000 01=0
80 50 01=00000 00=00000 01=0
81 51 01=00000 00=00000 01=0
82 52 01=00000 00=00000 01=0
83 53 01=00000 00=00000 01=0
84 54 01=00000 00=00000 01=0
85 55 01=00000 00=00000 01=0
86 56 01=00000 00=00000 01=0
87 57 01=00000 00=00000 01=0
88 58 01=00000 00=00000 01=0
89 59 01=00000 00=00000 01=0
90 60 01=00000 00=00000 01=0
91 61 01=00000 00=00000 01=0
92 62 01=00000 00=00000 01=0
93 63 01=00000 00=00000 01=0
94 64 01=00000 00=00000 01=0
95 65 01=00000 00=00000 01=0
96 66 01=00000 00=00000 01=0
97 67 01=00000 00=00000 01=0
98 68 01=00000 00=00000 01=0
99 69 01=00000 00=00000 01=0
100 70 01=00000 00=00000 01=0

```

```

31 87 07 07 07 07 07 07 07 07
32 88 07 07 07 07 07 07 07 07
33 89 07 07 07 07 07 07 07 07
34 90 07 07 07 07 07 07 07 07
35 91 07 07 07 07 07 07 07 07
36 92 07 07 07 07 07 07 07 07
37 93 07 07 07 07 07 07 07 07
38 94 07 07 07 07 07 07 07 07
39 95 07 07 07 07 07 07 07 07
40 96 07 07 07 07 07 07 07 07
41 97 07 07 07 07 07 07 07 07
42 98 07 07 07 07 07 07 07 07
43 99 07 07 07 07 07 07 07 07
44 00 07 07 07 07 07 07 07 07
45 01 07 07 07 07 07 07 07 07
46 02 07 07 07 07 07 07 07 07
47 03 07 07 07 07 07 07 07 07
48 04 07 07 07 07 07 07 07 07
49 05 07 07 07 07 07 07 07 07
50 06 07 07 07 07 07 07 07 07
51 07 07 07 07 07 07 07 07
52 08 07 07 07 07 07 07 07
53 09 07 07 07 07 07 07 07
54 10 07 07 07 07 07 07 07
55 11 07 07 07 07 07 07 07
56 12 07 07 07 07 07 07 07
57 13 07 07 07 07 07 07 07
58 14 07 07 07 07 07 07 07
59 15 07 07 07 07 07 07 07
60 16 07 07 07 07 07 07 07
61 17 07 07 07 07 07 07 07
62 18 07 07 07 07 07 07 07
63 19 07 07 07 07 07 07 07
64 20 07 07 07 07 07 07 07
65 21 07 07 07 07 07 07 07
66 22 07 07 07 07 07 07 07
67 23 07 07 07 07 07 07 07
68 24 07 07 07 07 07 07 07
69 25 07 07 07 07 07 07 07
70 26 07 07 07 07 07 07 07
71 27 07 07 07 07 07 07 07
72 28 07 07 07 07 07 07 07
73 29 07 07 07 07 07 07 07
74 30 07 07 07 07 07 07 07
75 31 07 07 07 07 07 07 07
76 32 07 07 07 07 07 07 07
77 33 07 07 07 07 07 07 07
78 34 07 07 07 07 07 07 07
79 35 07 07 07 07 07 07 07
80 36 07 07 07 07 07 07 07
81 37 07 07 07 07 07 07 07
82 38 07 07 07 07 07 07 07
83 39 07 07 07 07 07 07 07
84 40 07 07 07 07 07 07 07
85 41 07 07 07 07 07 07 07
86 42 07 07 07 07 07 07 07
87 43 07 07 07 07 07 07 07
88 44 07 07 07 07 07 07 07
89 45 07 07 07 07 07 07 07
90 46 07 07 07 07 07 07 07
91 47 07 07 07 07 07 07 07
92 48 07 07 07 07 07 07 07
93 49 07 07 07 07 07 07 07
94 50 07 07 07 07 07 07 07
95 51 07 07 07 07 07 07 07
96 52 07 07 07 07 07 07 07
97 53 07 07 07 07 07 07 07
98 54 07 07 07 07 07 07 07
99 55 07 07 07 07 07 07 07
100 56 07 07 07 07 07 07 07

```

```

60 86 07 07 07 07 07 07 07 07
61 87 07 07 07 07 07 07 07 07
62 88 07 07 07 07 07 07 07 07
63 89 07 07 07 07 07 07 07 07
64 90 07 07 07 07 07 07 07 07
65 91 07 07 07 07 07 07 07 07
66 92 07 07 07 07 07 07 07 07
67 93 07 07 07 07 07 07 07 07
68 94 07 07 07 07 07 07 07 07
69 95 07 07 07 07 07 07 07 07
70 96 07 07 07 07 07 07 07 07
71 97 07 07 07 07 07 07 07 07
72 98 07 07 07 07 07 07 07 07
73 99 07 07 07 07 07 07 07 07
74 00 07 07 07 07 07 07 07 07
75 01 07 07 07 07 07 07 07 07
76 02 07 07 07 07 07 07 07 07
77 03 07 07 07 07 07 07 07 07
78 04 07 07 07 07 07 07 07 07
79 05 07 07 07 07 07 07 07 07
80 06 07 07 07 07 07 07 07 07
81 07 07 07 07 07 07 07 07
82 08 07 07 07 07 07 07 07
83 09 07 07 07 07 07 07 07
84 10 07 07 07 07 07 07 07
85 11 07 07 07 07 07 07 07
86 12 07 07 07 07 07 07 07
87 13 07 07 07 07 07 07 07
88 14 07 07 07 07 07 07 07
89 15 07 07 07 07 07 07 07
90 16 07 07 07 07 07 07 07
91 17 07 07 07 07 07 07 07
92 18 07 07 07 07 07 07 07
93 19 07 07 07 07 07 07 07
94 20 07 07 07 07 07 07 07
95 21 07 07 07 07 07 07 07
96 22 07 07 07 07 07 07 07
97 23 07 07 07 07 07 07 07
98 24 07 07 07 07 07 07 07
99 25 07 07 07 07 07 07 07
100 26 07 07 07 07 07 07 07

```


100

11	1680	0076760	17.120.1.144.0.2	34	2020	0076760	1.149.0.141.149	54	32	32	32	32
12	1680	0076760	17.120.1.144.0.2	35	2020	0076760	1.149.0.141.149	55	32	32	32	32
13	1680	0076760	17.120.1.144.0.2	36	2020	0076760	1.149.0.141.149	56	32	32	32	32
14	1680	0076760	17.120.1.144.0.2	37	2020	0076760	1.149.0.141.149	57	32	32	32	32
15	1680	0076760	17.120.1.144.0.2	38	2020	0076760	1.149.0.141.149	58	32	32	32	32
16	1680	0076760	17.120.1.144.0.2	39	2020	0076760	1.149.0.141.149	59	32	32	32	32
17	1680	0076760	17.120.1.144.0.2	40	2020	0076760	1.149.0.141.149	60	32	32	32	32
18	1680	0076760	17.120.1.144.0.2	41	2020	0076760	1.149.0.141.149	61	32	32	32	32
19	1680	0076760	17.120.1.144.0.2	42	2020	0076760	1.149.0.141.149	62	32	32	32	32
20	1680	0076760	17.120.1.144.0.2	43	2020	0076760	1.149.0.141.149	63	32	32	32	32
21	1680	0076760	17.120.1.144.0.2	44	2020	0076760	1.149.0.141.149	64	32	32	32	32
22	1680	0076760	17.120.1.144.0.2	45	2020	0076760	1.149.0.141.149	65	32	32	32	32
23	1680	0076760	17.120.1.144.0.2	46	2020	0076760	1.149.0.141.149	66	32	32	32	32
24	1680	0076760	17.120.1.144.0.2	47	2020	0076760	1.149.0.141.149	67	32	32	32	32
25	1680	0076760	17.120.1.144.0.2	48	2020	0076760	1.149.0.141.149	68	32	32	32	32
26	1680	0076760	17.120.1.144.0.2	49	2020	0076760	1.149.0.141.149	69	32	32	32	32
27	1680	0076760	17.120.1.144.0.2	50	2020	0076760	1.149.0.141.149	70	32	32	32	32
28	1680	0076760	17.120.1.144.0.2	51	2020	0076760	1.149.0.141.149	71	32	32	32	32
29	1680	0076760	17.120.1.144.0.2	52	2020	0076760	1.149.0.141.149	72	32	32	32	32
30	1680	0076760	17.120.1.144.0.2	53	2020	0076760	1.149.0.141.149	73	32	32	32	32
31	1680	0076760	17.120.1.144.0.2	54	2020	0076760	1.149.0.141.149	74	32	32	32	32
32	1680	0076760	17.120.1.144.0.2	55	2020	0076760	1.149.0.141.149	75	32	32	32	32
33	1680	0076760	17.120.1.144.0.2	56	2020	0076760	1.149.0.141.149	76	32	32	32	32
34	1680	0076760	17.120.1.144.0.2	57	2020	0076760	1.149.0.141.149	77	32	32	32	32
35	1680	0076760	17.120.1.144.0.2	58	2020	0076760	1.149.0.141.149	78	32	32	32	32
36	1680	0076760	17.120.1.144.0.2	59	2020	0076760	1.149.0.141.149	79	32	32	32	32
37	1680	0076760	17.120.1.144.0.2	60	2020	0076760	1.149.0.141.149	80	32	32	32	32
38	1680	0076760	17.120.1.144.0.2	61	2020	0076760	1.149.0.141.149	81	32	32	32	32
39	1680	0076760	17.120.1.144.0.2	62	2020	0076760	1.149.0.141.149	82	32	32	32	32
40	1680	0076760	17.120.1.144.0.2	63	2020	0076760	1.149.0.141.149	83	32	32	32	32
41	1680	0076760	17.120.1.144.0.2	64	2020	0076760	1.149.0.141.149	84	32	32	32	32
42	1680	0076760	17.120.1.144.0.2	65	2020	0076760	1.149.0.141.149	85	32	32	32	32
43	1680	0076760	17.120.1.144.0.2	66	2020	0076760	1.149.0.141.149	86	32	32	32	32
44	1680	0076760	17.120.1.144.0.2	67	2020	0076760	1.149.0.141.149	87	32	32	32	32
45	1680	0076760	17.120.1.144.0.2	68	2020	0076760	1.149.0.141.149	88	32	32	32	32
46	1680	0076760	17.120.1.144.0.2	69	2020	0076760	1.149.0.141.149	89	32	32	32	32
47	1680	0076760	17.120.1.144.0.2	70	2020	0076760	1.149.0.141.149	90	32	32	32	32
48	1680	0076760	17.120.1.144.0.2	71	2020	0076760	1.149.0.141.149	91	32	32	32	32
49	1680	0076760	17.120.1.144.0.2	72	2020	0076760	1.149.0.141.149	92	32	32	32	32
50	1680	0076760	17.120.1.144.0.2	73	2020	0076760	1.149.0.141.149	93	32	32	32	32
51	1680	0076760	17.120.1.144.0.2	74	2020	0076760	1.149.0.141.149	94	32	32	32	32
52	1680	0076760	17.120.1.144.0.2	75	2020	0076760	1.149.0.141.149	95	32	32	32	32
53	1680	0076760	17.120.1.144.0.2	76	2020	0076760	1.149.0.141.149	96	32	32	32	32
54	1680	0076760	17.120.1.144.0.2	77	2020	0076760	1.149.0.141.149	97	32	32	32	32
55	1680	0076760	17.120.1.144.0.2	78	2020	0076760	1.149.0.141.149	98	32	32	32	32
56	1680	0076760	17.120.1.144.0.2	79	2020	0076760	1.149.0.141.149	99	32	32	32	32
57	1680	0076760	17.120.1.144.0.2	80	2020	0076760	1.149.0.141.149	100	32	32	32	32

100

LISTING

[illegible]

LISTINGS

[illegible]

LISTINGS

[illegible]

FUNCTION KEY TEMPLATE

Please refer to Listings below
typing in any program.

PROGRAM: FIVE KEY

```

100 1 GOLOS
101 2 SAVE--50 KEY TEMP, 5 VERIFY
102 3 KEY TEMP, 5 GOLOS
103 4 KEY TEMP, 5 TO 1 IN 400
104 50 KEY *** YOUR COMMENTS ***
105 60 KEY *** 44 FUNCTION KEY T
106 70 KEY *** PROGRAM OF JOHN &
107 80 KEY *** INITIAL SCREEN 01
108 90 PRINT(14,1):PRINT(10,1)
109 100 PRINT(14,1):PRINT(10,1)
110 110 PRINT(14,1):PRINT(10,1)
111 120 PRINT(14,1):PRINT(10,1)
112 130 PRINT(14,1):PRINT(10,1)
113 140 PRINT(14,1):PRINT(10,1)
114 150 PRINT(14,1):PRINT(10,1)
115 160 PRINT(14,1):PRINT(10,1)
116 170 PRINT(14,1):PRINT(10,1)
117 180 PRINT(14,1):PRINT(10,1)
118 190 PRINT(14,1):PRINT(10,1)
119 200 PRINT(14,1):PRINT(10,1)
120 210 PRINT(14,1):PRINT(10,1)
121 220 PRINT(14,1):PRINT(10,1)
122 230 PRINT(14,1):PRINT(10,1)
123 240 PRINT(14,1):PRINT(10,1)
124 250 PRINT(14,1):PRINT(10,1)
125 260 PRINT(14,1):PRINT(10,1)
126 270 PRINT(14,1):PRINT(10,1)
127 280 PRINT(14,1):PRINT(10,1)
128 290 PRINT(14,1):PRINT(10,1)
129 300 PRINT(14,1):PRINT(10,1)
130 310 PRINT(14,1):PRINT(10,1)
131 320 PRINT(14,1):PRINT(10,1)
132 330 PRINT(14,1):PRINT(10,1)
133 340 PRINT(14,1):PRINT(10,1)
134 350 PRINT(14,1):PRINT(10,1)
135 360 PRINT(14,1):PRINT(10,1)
136 370 PRINT(14,1):PRINT(10,1)
137 380 PRINT(14,1):PRINT(10,1)
138 390 PRINT(14,1):PRINT(10,1)
139 400 PRINT(14,1):PRINT(10,1)
140 410 PRINT(14,1):PRINT(10,1)
141 420 PRINT(14,1):PRINT(10,1)
142 430 PRINT(14,1):PRINT(10,1)
143 440 PRINT(14,1):PRINT(10,1)
144 450 PRINT(14,1):PRINT(10,1)
145 460 PRINT(14,1):PRINT(10,1)
146 470 PRINT(14,1):PRINT(10,1)
147 480 PRINT(14,1):PRINT(10,1)
148 490 PRINT(14,1):PRINT(10,1)
149 500 PRINT(14,1):PRINT(10,1)
150 510 PRINT(14,1):PRINT(10,1)
151 520 PRINT(14,1):PRINT(10,1)
152 530 PRINT(14,1):PRINT(10,1)
153 540 PRINT(14,1):PRINT(10,1)
154 550 PRINT(14,1):PRINT(10,1)
155 560 PRINT(14,1):PRINT(10,1)
156 570 PRINT(14,1):PRINT(10,1)
157 580 PRINT(14,1):PRINT(10,1)
158 590 PRINT(14,1):PRINT(10,1)
159 600 PRINT(14,1):PRINT(10,1)
160 610 PRINT(14,1):PRINT(10,1)
161 620 PRINT(14,1):PRINT(10,1)
162 630 PRINT(14,1):PRINT(10,1)
163 640 PRINT(14,1):PRINT(10,1)
164 650 PRINT(14,1):PRINT(10,1)
165 660 PRINT(14,1):PRINT(10,1)
166 670 PRINT(14,1):PRINT(10,1)
167 680 PRINT(14,1):PRINT(10,1)
168 690 PRINT(14,1):PRINT(10,1)
169 700 PRINT(14,1):PRINT(10,1)
170 710 PRINT(14,1):PRINT(10,1)
171 720 PRINT(14,1):PRINT(10,1)
172 730 PRINT(14,1):PRINT(10,1)
173 740 PRINT(14,1):PRINT(10,1)
174 750 PRINT(14,1):PRINT(10,1)
175 760 PRINT(14,1):PRINT(10,1)
176 770 PRINT(14,1):PRINT(10,1)
177 780 PRINT(14,1):PRINT(10,1)
178 790 PRINT(14,1):PRINT(10,1)
179 800 PRINT(14,1):PRINT(10,1)
180 810 PRINT(14,1):PRINT(10,1)
181 820 PRINT(14,1):PRINT(10,1)
182 830 PRINT(14,1):PRINT(10,1)
183 840 PRINT(14,1):PRINT(10,1)
184 850 PRINT(14,1):PRINT(10,1)
185 860 PRINT(14,1):PRINT(10,1)
186 870 PRINT(14,1):PRINT(10,1)
187 880 PRINT(14,1):PRINT(10,1)
188 890 PRINT(14,1):PRINT(10,1)
189 900 PRINT(14,1):PRINT(10,1)
190 910 PRINT(14,1):PRINT(10,1)
191 920 PRINT(14,1):PRINT(10,1)
192 930 PRINT(14,1):PRINT(10,1)
193 940 PRINT(14,1):PRINT(10,1)
194 950 PRINT(14,1):PRINT(10,1)
195 960 PRINT(14,1):PRINT(10,1)
196 970 PRINT(14,1):PRINT(10,1)
197 980 PRINT(14,1):PRINT(10,1)
198 990 PRINT(14,1):PRINT(10,1)
199 1000 PRINT(14,1):PRINT(10,1)

```


LISTINGS

[illegible]

[illegible][illegible][illegible]

ADVENTURE GET IT

Please allow us 1 business day before
posting an order correction.

PAGE NO. **DATE**

00 10 rue de Valenciennes 115. Paris
1.

1000

[illegible]

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2049 - Chelonia 314, 760, 78, 100, 1

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Slight changes were made to the listing of our CIB and Plus/4 programs **REBOUND** in the October 1987 issue of the magazine after the text was produced.

The listing was correct in the magazine. There is only one part to it, not two as indicated in the text. This listing should be entered as described using the **MONITOR** function of the computer.

To use the program you should **LOAD** it from within the monitor as follows:

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1. "REBOUND",1
where 1 is 1 if using tape or 8 if using
disk. Then enter G1000 to RUN the
program.
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Bug Finder

We'd like to remind our readers that we run a Bug Finder service.

If you have typed in one of our programmes and despite much checking, you still can't get it to run, then send us the following:

Two copies of your program on tape or disk.

A description of your problem.

If possible a listing of your work (you may omit this).

A stamped, self-addressed envelope for return of the program to you.

Should any of the above be missing

then we will not be able to deal with your query.

We will try to point out where you have made errors and place a corrected copy of the program back on to your tape or disk before we return it to you.

Do not send a program to us as soon as it stops working, please check it several times first.

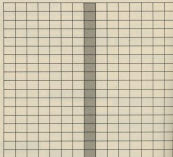
We do get a large number of queries and so it may take a while for us to deal with yours personally.

Newsies can only deal with problems relating to programmes published in *Your Commodore*.

Puzzle

Solve the sixteen clues below and then enter the answers, which are all computer related, on the grid in such a way that reading down the central column will give you a phrase associated with computers.

1. Train stops temporary storage area (7)
2. Set of instructions on the box (7)
3. Break in true print (8)
4. Resizable memory from 1000 pointless ropes (2)
5. Language rules sound like VAT in Scots (8)
6. Nasty computer? (9)
7. Blossom gets round print procedure (10)
8. Print screen on or off (5)
9. Casters off for storage device (8)
10. Poem in two thousand about data transmitter (2)
11. Program made for rust (8)
12. Vindicate word alignment (7)
13. Endless foreign friend gets a computer (5)
14. A bad talker produces data transmission frequency (4, 4)
15. Using DOST on number 25 (6)
16. Language hurried after castle (7)



13. Tour in east is part of the program (7)

18. Machine code side-memory (9)



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